HAWKWOOD SITE (EgPm-179): A MULTI-COMPONENT PREHISTORIC CAMPSITE ON NOSE HILL

by

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HAWKWOOD SITE
EgPm-179
A MULTI-COMPONENT PREHISTORIC CAMPSITE ON NOSE HILL
(ASA PERMIT 81-04)

Prepared For

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MANAGEMENT SUMMARY

Archaeological studies at the Hawkwood Site (EgPm-179) were initiated in response to the planned construction of a residential subdivision in northwest Calgary. The planned construction was to be preceded by significant terraforming which was to result in the total removal of sediments containing prehistoric material. Archaeological studies involved the excavation of 132 square metres en block on two sedimentary basins. An additional two square metres were excavated in a depression at the extreme east end of the site area.

The stratigraphy of the two basins was similar and consisted of a deep profile in the central area of the depressions thinning to the margins of the basins. The upper zone of the profiles consisted of re-deposited colluvial slope wash on which a typical A/B soil had developed. These sediments contained evidence of faunaturbation which was later demonstrated to have resulted in vertical, but not horizontal mixing. This sequence of sediments was underlain by a buried ash, the Mazama ash, known to date to approximately 6600 B.P. The lower zone consisted of a series of paleosols (N=4) embedded in a matrix of silty-clay. The base of the site was marked by a clay rich till.

Six prehistoric components were identified between the two basins. The earliest component was dated directly to 8250 B.P. and consisted of a Lusk point, a Salmon River Side Notched point, a stemmed atlatl, four point fragments, three bifaces, an end scraper, and a possible grinder. The assemblage is transitional between Plains/Mountain and Mummy Cave complexes.

Component 2 was directly dated to 6820 B.P. and consisted of bifaces, scrapers, spall tools, a core/chopper and retouched flakes, but lacked diagnostic projectile points. On the basis of

its stratigraphic position the assemblage is attributed to an Early Mummy Cave occupation.

Component 3 lies immediately below the Mazama Ash and is dated stratigraphically to 6800 B.P. The assemblage consisted of a projectile point tip, bifaces, a side scraper, a predominance of large spall tools, core/choppers, a significant number of retouched flakes and a hammerstone. The assemblage represents an early Mummy Cave occupation.

Component 4 lies immediately above the Mazama Ash deposit and is dated stratigraphically to 6500 B.P. The assemblage consists of two Bitterroot side notched points, bifaces, a scraper, wedges, a large number of spall tools and a modest number of retouched flakes. The assemblage represents a Mummy Cave occupation.

Component 5 is situated within the upper zone of sediments and is dated typologically to 4000 B.P. The assemblage consists of seven Oxbow and one Hanna projectile point(s). In addition, the assemblage included bifaces, scrapers, spall tools, cobble/core choppers, wedges, retouched flakes and an inordinately high number of debitage specimens. This assemblage represents an Oxbow occupation.

Ancillary data derived from the excavations yields a consistent pattern of landuse over the past 8,000 years. Stone features including structures and hearths were present in most of the components. In terms of major typological catagories, the assemblages were found to be remarkably similar. The faunal material suggests a late winter/early spring occupation of relatively short duration. Butchering patterns, too, were remarkably similar. Butchering was confined to limb elements (i.e., light butchering). The function of the occupation appears to be involved with the processing of meat from isolated kills

made in the nearby sloughs.

The results of the Hawkwood excavation demonstrated a significant interpretive potential associated with the depressional features on Nose Hill. Gaps in the archaeological record, as expressed in the Hawkwood site (primarily of the Tunaxa Tradition), are known to be present elsewhere on the uplands north of Calgary and represent a significant asset to future generations of archaeologists.

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1. INTRODUCTION

Phase I of the Hawkwood Development is a residential development of Melcor Developments Ltd. located on Nose Hill, north and west of downtown Calgary, Alberta. During the planning stages of the residential development it was determined that the Phase I area would require massive terraforming and relocation of earthfill. With minor exceptions all lands within the Phase I area would be stripped of post-glacial overburden and substantial amounts of the till deposits. It was determined that these activities, preparatory to the construction of the residential district, would result in the removal of all prehistoric and historic resources which were known or predicted to lie within the development area. Shortly before this period, archaeological studies in support of various other developments on Nose Hill had resulted in the discovery of a large number of prehistoric campsites on the high ground between the proposed site of the Nose Hill Park and the Spy Hill Jail. This apparent concentration of prehistoric resources argued for a need to inventory and assess the prehistoric resources of the Phase I parcel prior to development (Figure 1).

1.1 PREVIOUS STUDIES

In April, May and June of 1979, an Historical Resources Impact Assessment (Archaeological Survey of Alberta Permit #79-08) was carried out of the Phase I parcel, a portion of an area designated as the Crowchild II development. Inventory and assessment of the parcel involved judgmental foot traverses during which stone features and surficial artifact concentrations were identified, a mapping program during which stone features were white washed and photographed from the air, and a testing program. The mapping program also involved the preparation of stone feature maps of individual rings. The subsurface test excavation program involved both the excavation of 2x2 m test

units and a backhoe test program.

Archaeological studies resulted in the recording of seven prehistoric sites within the Phase I boundary (Figure 2). As a result of the assessment, it was concluded that a comprehensive archaeological program would be required to mitigate projected impacts to the parcel which would result from the massive terraforming activities. The recommendations included a program which would result in the completion of the ring studies, i.e., weighing each of the ring rocks, a testing of various other sites and full scale research excavations at EgPm-179.

Review of the data acquired during the Historical Resources Impact Assessment by the Archaeological Survey of Alberta resulted in a rejection of our recommendations for further work on stone circles within the study area and our recommendation for site specific testing on prehistoric resources for which the assessment was not adaquate to determine values. However, the Archaeological Survey of Alberta concurred fully with the need for conservation studies on a proven multi-component site designated as EgPm-179.

A contract for work in conjunction with the mitigation of impacts to EgPm-179 was put to bid on October 1, 1980. Following successful award of the contract on November 19, 1980, a permit was acquired from the Archaeological Survey of Alberta (81-4) in February of 1981. Archaeological studies were carried out by Lifeways of Canada on behalf of Melcor Developments Ltd.

The Hawkwood project was directed by Mr. Stan Van Dyke. Field supervision was shared with Mr. Tom Head. A great many staff archaeologists were involved with the excavation, particularly near the completion of the project when, under a construction deadline, additional staff was acquired from the Department of Archaeology, University of Calgary.

2. SITE SETTING

The Hawkwood site, i.e., EgPm-179, covered an area of several hundred square metres which enclosed two depressional basins immediately north of an escarpment which forms the southern boundary of the Nose Hill uplands. The site area is located in LSD 1/14/25/2/W5M (11UPG983676) approximately 1/4 mile north of the Ranchlands II subdivision and John Laurie Blvd. In most respects, the Hawkwood site did not differ in appearance from a large number of other sites known to be present on the Nose Hill uplands. The two basins in the site area were enclosed on one or more sides by ridges which afforded the occupants with some shelter. The western basin contained two stone features (c.f., Head and Smith 1980:51-54) within the depositional feature and a third located on a saddle northwest of the depression at the location of a cart road (Plate 1).

Superficial deposits of till overlie Cenozoic sandstones of the Paskapoo Formation which protrude through the overlying tills in selected areas along the slopes of uplands and in various creek and coulee channels which drain the escarpment. Surficial features reflect their glacial origins and include various types of moraines, esker and spillway deposits. The hummocky ground moraine is characteristic of the entire upland area as well as the slopes above the pro-glacial channel of the Bow River. Holocene colluvial deposits form a thin blanket over the study area, concentrating within the remnant depressions formed by ice disintegration.

The present vegetation consists principally of mixed fescue grassland occasionally marked by the presence of encroaching stands of willow, poplar and, more rarely, spruce. The wooded stands generally occur within depressional features, coulees and channels, and/or on the north facing slopes of the uplands. Land

use of the site area has been restricted during the historical period to that of pasture. As such, disturbance to the site area has been minimal.

The potential resources available to the occupant or intermittent user of the Nose Hill uplands are as varied as a listing of the extant plains species. Deer (Odocoileus hemionus and O. virginianus), elk, antelope, and, in the past, at least seasonally, bison were the principal ungulates to have utilized the uplands environment. Small mammals including rabbits, wolf, coyote and others were also present. Geese and other waterfowl were present in the sloughs on a seasonal basis.

The biotic potential of the uplands was not, at any time in the past, a constant on which hunters could depend. Seasonal factors influenced the distribution and density of available game on the uplands just as changes in the regional climate were to affect the overall distributions of game within the region over the millenia. In most cases, however, man, in conjunction with other predators, was a major factor affecting local perturbations and fluctuations in the year to year availability of game and other resources.

Climate, in very general terms, was the most persuasive element in the determination of overall land use patterns. Both short-term fluctuations, periodic and capricious, and long-term changes in the environment, are held to be responsible for changes in the way in which man made a living from the land. Changes in climate resulted in changes in the game species present, their numbers and their behavior. Climate here is used to refer to temperatures, precipitation, patterns of wind direction and strength and changes in the seasonal character of these factors. The present climate is of the continental type with short cool summers and long cold winters. The severity of the regional climate is somewhat moderated by the occurrence of

occasional foehn winds--Chinooks. Past climates, however, could perhaps have been different, if not in fact, certainly as measured by their effects.

Paleo-climates for the Calgary region have not been worked out with precision. In general, the postglacial record may be subdivided into three episodes--the Anathermal or Late Glacial and Early Post-Glacial, the Hypsithermal (cf. Bryson etal 1970) or Altithermal (cf. Antevs 1955), and the Neo-Glacial or Late Post-Glacial. An alluvial fill sequence for the Bow River valley which corresponds to these episodes has recently been constructed by M. Wilson (1981) (Figure 31). One objective of this study is to achieve some correlation of the stratigraphy of colluvial deposits at EgPm-179 with the various periods of alluviation/climate as represented in the deposits of the Bow River valley. The presence of phantom soil zones or turf zones (paleosols)--stable periods--in the colluvial deposits of the depression on the Nose Hill uplands provides a tentative basis for the correlation (see Geological Stratigraphy, Section 4.2).

The cultural setting of the site is poorly known. In the early historic period and the late prehistoric period, the Calgary region was occupied by members of the Blackfoot Confederacy (Blackfoot, Blood, Peigan, and Sarcee; McIntyre and Reeves 1975a:6). In the Sarcee language the Calgary region was considered an important area of settlement. Their occupation--Stony and Sarcee--was relatively recent and dates no earlier than the 1700s (Ibid., p. 22). According to Reeves, Fidler (1792) and Hector (1859) both make reference to encampments in the Bow River valley (1975:20). Land use during the early historic period, however, is poorly understood. Proto-historic encampments, documented by reference to the presence of metal trade projectile points, are known at Fish Creek (Smith, Calder and Reeves 1977), on the east bank of the Bow River opposite Fish Creek (Van Dyke 1980a) and on Nose Creek

near Balzac (Loveseth 1981:personal communication).

Euro-Canadian settlement, in contrast to the establishment of the early posts, began during the late 1800s. The ever increasing development of the Calgary region has resulted in considerable modification of the landscape. For the most part, the Nose Hill uplands have, until recently, escaped this development. The lands surrounding EgPm-179 have, for the most part, been utilized for little more than cattle and horse pasture.

3. CONSERVATION EXCAVATIONS

The terms of reference for archaeological studies at EgPm-179 were based on a consideration of the extent of the site, the known distribution of archaeological material, the number of components present and the quality of material which had been recovered during the course of the Historical Resources Impact Assessment. The results of the initial assessment of the site suggested that the resource was of considerable significance. The primary value of the site lay in the presence of the deeply buried occupations and their contents. The 2x2 m window approach to the assessment caused some concern as there was a possibility that the archaeological resource, as measured by the contents of the site, lacked integrity. It was surmised that the archaeological contents--the artifacts and faunal material present--may have been displaced from the surrounding high ground and washed downslope into the basin. With that qualification the Archaeological Survey of Alberta required that 100 sq. m of the site area be excavated in the two basins present on the site.

In order to prove the integrity of the site, the research design called for the opening of en block excavation areas in which features and artifactual distributions could be recognized. Adequate excavation planning required that the initial portion of the study involve the removal of trench-like features across the site designed to determine the volume of the cultural deposits.

A significant constraint was imposed on the excavation by the conditions under which the site was to be excavated. Faced with a construction deadline of May 1, 1981, archaeological studies were required under winter conditions. In preparation for these conditions, and after the award of the contract, the ground area within the two excavation areas were covered with approximately 1/2 m of straw over which 6 mm plastic tarping was laid. This

served to reduce frost penetration during the colder months of winter (Plate 2). Immediately prior to the start of work, a 2x4 wood frame structure was constructed to cover the western of the two excavation areas--the first to be excavated. This was covered by 6 mm plastic tarping. The structures were heated by propane jet heaters. Once in place the heaters were fired up in order to thaw any remaining frozen sediment (Plate 3). At the completion of work on the western basin, the structure was dismantled and removed to the eastern basin and to subsequent outlying excavational areas. In conjunction with a relatively mild winter, the procedures of winter excavation proved highly successful (Head 1982).

3.1 RESEARCH DESIGN

The research design implemented at the Hawkwood site was straight forward in concept and normal to archaeological resource management. The primary objective was the recovery of an assemblage representative of the deeply buried components, the determination of the function of the site, the age of the site and the cultural affiliation of its contents.

The site area was initially given as 1500 sq. m. The site area was initially calculated so as to enclose the two sedimentary basins and the locations of three stone circle features (Figure 2). Not all areas of the site had equal potential for exhibiting evidence of the deeply buried components. The perimeter of the site was formed by ridge-like features. These features were characterized by exposed till or till with a thin veneer of sediments. From the apex of the ridge toward the centre of the depression, one encounters an erosional surface followed by a depositional environment. For the most part, the slope of the present depression mimics that of buried surfaces; however, the slope of buried surfaces increased with depth. The original surface of the depression was considerably more bowl-like than

the present surface. The compression of the archaeological components along the perimeter of the depositional zone and our expectation that significant behavioral activity areas would be located more closely to the central area of the depressional feature, suggested that the most productive zone in which to concentrate the en block excavations would be the central area of the depression. The initial trench excavations were designed to confirm that the central area of the present surface was coincident with the central area of the original structure of the depression.

The allocated level of effort was set at 100 sq. m of which approximately 75% was to be placed on the larger of the two basins. Subsequent excavations proved that the second basin, in its original form, was broader than anticipated on the basis of its surface configuration. With the advice and consent of the Archaeological Survey of Alberta, an additional 32 sq. m was allowed for the excavation of the second basin.

En block excavations were utilized in preference to a series of smaller excavational blocks in order to maximize the recovery of spatial information related to activity areas.

3.2 METHODOLOGY

Archaeological studies involved the hand removal of sediments using shovels and/or trowels. Provenience was controlled by 1 sq. m areas. All culture bearing sediments were screened mechanically through 1/4" mesh screening. All artifactual material and features identified *in situ* were measured in and/or mapped. Artifacts located *in situ* were bagged, processed and curated individually. Material recovered from screening was bagged, processed and curated by unit/level lots. Catagories of artifactual material considered in the analysis included lithic specimens, faunal remains and fire broken rock. Transformation

from physical objects to categories of information inherently results in the loss of information, primarily context and ancillary data. However, the transformation also results in a reduction of information from its real state to a series of classificatory units. The classes and types utilized in the description and analysis of artifactual and ancillary data dealt with in this report are modified from those traditionally employed on the Plains, foothills and mountains.

The principal source of typology and analytical reduction procedures used for this report is that found in guidelines for analysis prepared by Dr. Brian Reeves of the Department of Archaeology at the University of Calgary (1972). These procedures and the types which result are common to the Plains, but are specifically applicable to the Plains/Mountain continuum. It has been found that while classical Plains typologies serve the interests of most archaeological resources within the grasslands region, there are also significant differences in attribute associations, materials utilized and the range of typological variation to be found in collections from prehistoric sites located along the eastern slopes of the Rocky Mountains. In consideration of these differences, there is a preference for classification according to types defined for the Mountain zones (cf. Reeves 1970, 1972).

The level of analysis utilized in this report involves the separation of lithics into formed tools, detritus and ancillary data (e.g., fire broken rock). Formed tools are subdivided by types. Variation is discussed, by attribute, separately within the type description. Lithic detritus is divided according to classes associated with the core reduction sequence. These classes are primarily descriptive (i.e., primary decortication flakes, secondary decortication flakes, secondary flakes and retouch or finishing flakes). Faunal material is, where possible, identified as to species and treated by butchering

units. Fire broken rock is treated by weight and degree of breakage (e.g., size and angularity).

Artifacts and their associated ancillary data are treated as an assemblage. Assemblages which have discrete and measurable provenience in spatial or stratigraphic terms are treated as components. Components are treated as seasonal and functional variants of a subphase. Subphases were introduced by Reeves in his dissertation (1970) primarily to segregate geographical or temporal variants. Subphases are grouped into phases. Phases are a conventional concept which refer primarily to Cultural Historical Units with clearly recognized diagnostic referents. Higher orders of comparison, at this level of analysis, are expressly dealt with in more casual terms in which comparison to major recognized type sites is carried out by "index types", primarily projectile point styles.

4. THE HAWKWOOD SITE

The Hawkwood site lies on the southwestern margin of the Nose Hill Uplands, a linear structure which originates at a point overlooking downtown Calgary and continues northwestward along the Bow River toward Cochrane. The Uplands area is mantled by a thin layer of drift. Along its length the character of the uplands changes markedly. From a cusp-like feature marked by level to undulating hills at its southeastern terminus, the character of the terrain gives way to severely pocked hummocky terrain marked by frequent slough-like features in the vicinity of the Hawkwood site. To the northwest, the terrain again becomes less severe.

The Nose Hill Uplands rises approximately 150 m above the valley floor below and contains several geographical areas of note--Nose Hill, Spy Hill and so forth. The entire feature is dissected by gullies, coulees and runoff channels. The southwestern margin of the uplands tends to be higher and more exposed than the northeastern margin. The vegetation of these exposed areas is dominated by fescue grasslands which have probably characterized the area for over 10,000 years. Small stands of poplar and willow mark sheltered north facing slopes and the coulee bottoms.

These uplands, particularly in the area between Nose Hill and Spy Hill proper, appear to exhibit archaeological site densities unequalled elsewhere in the Calgary region (cf. Van Dyke 1980b; Head and Smith 1980; Calder 1977; Rogers 1972). Excavations carried out on the uplands have resulted in the acquisition of information which suggests that they have been repeatedly, although intermittently, occupied for over 7000 years by groups of people with disparate cultural traditions. One of the objectives entertained in this report is the attempt to give meaning to these repeated occupations. For example, do the Nose Hill Uplands represent a unique and favorable habitat which have

served to attract occupation and use over this period of time, or are the distribution and range of prehistoric sites on the uplands the result of circumstantial factors, unrelated to the uniqueness of the geographical surroundings.

Beyond the above, our objectives are somewhat pedestrian and relate to questions of cultural historical reconstruction. Analysis at this level is primarily concerned with providing meaningful comparisons and interpretations of the various components present. Although pedestrian in approach, the significance of the earliest components from the Hawkwood Site is far from pedestrian. From a chronological perspective, the age of the earliest component of the Hawkwood Site compares favorably with the Mona Lisa Site (EgPm-3)--the earliest radiocarbon dated site in the City of Calgary (Wilson 1974, 1980, and 1981). Although earlier sites are known to be present throughout the Calgary region, most have been surface finds which have been dated typologically (e.g., Christensen 1971; Reeves 1974: personal communication). The earliest excavated finds within the Calgary and surrounding vicinity have mostly been typologically dated (e.g., Gryba 1980; McIntyre and Reeves 1975b), although recent dates have become available from EgPr-2 (Ball 1983).

From a processual perspective, even a simple comparison of component assemblages from the Hawkwood Site serve to draw us into a discussion of cultural dynamics on the northern Plains. Further, any interpretation posited requires an explanation vis a vis extant interpretations of land use patterns on the northern Plains (cf. Reeves 1972; Buchner 1980).

In any case, for the given geographical context and no doubt for the activities practiced, the Hawkwood Site is presently unique in the Calgary Region. Although it is suspected that similar sites would occur throughout the hummocky terrain of the Nose Hill Uplands (e.g., EgPn-146), we are forced, presently, to

assume that the Hawkwood Site will forever remain one of the few examples of this particular seasonal/functional variant of prehistoric land use.

4.1 EXCAVATIONS

Archaeological excavations at the Hawkwood Site were carried out between the middle of February and the end of April of 1981. Excavation was centred on two major basins, hereafter referred to as the East (Figure 3) and West (Figure 4) Basins. A small exploratory test unit (1x2 m) was excavated in a third, but smaller, basin to the east (Figure 2) but bottomed out in water saturated sediments. The yields of the exploratory unit were confusing and poorly represented. As such, information derived from the exploratory unit are discussed only in the context of component summaries and the conclusions to this report. Excavations at EgPm-179 involved the removal of more than 132 sq m. Of this total, 70 sq. m were excavated from the West Basin and 62 sq. m were excavated from the East Basin.

Previous test excavations in the West Basin resulted in the identification of three cultural components, the lowermost of which was dated to 7030 ± 210 B.P. (Head and Smith 1980). Five components were identified in the East Basin, the lowermost of which was dated to 8250 ± 330 B.P. Only the upper two components--Occupations 5 and 6--could be correlated between the two basins. The remaining components are either distinctive cultural historical units or are stratigraphically different. Three of the six components lie below the Mazama Ash deposit dated to 6600 B.P.

The lowermost component--Occupation 1--has been attributed to the Plains Mountain Complex. Occupations 2 and 3 have been attributed to the Early Mummy Cave Complex. Occupation 4 is a later Mummy Cave, Bitterroot occupation. The upper two

components have been attributed to the Oxbow/McKean complex and the Old Woman's Phase--Occupations 5 and 6 respectively. The occupations/components recognized during the test excavations and later during the conservation excavations were, for the most part, separated by sterile sediments. At the margins of both basins, however, the separation is far less clear. Excavations were carried out using a combination of stratigraphic and arbitrary levels corresponding to the cultural components.

In the discussions that follow, assemblages from both the East and West Basins are treated together where a correlation has been established. At the same time we have maintained an explicit recognition of differences, particularly with regard to spatial structure of features and artifactual distributions. Such differences that do exist between the two basins for correlated components are discussed in the concluding remarks on each component.

Detailed stratigraphic comments, where necessary, are discussed with the component descriptions. Prior to embarking on the specific component descriptions, however, a brief summary description of the sedimentary profile is presented.

4.2 STRATIGRAPHY (Plates 4 and 5)

The sediments which envelop the cultural deposits of the Hawkwood Site are the result of continuous slope wash and infilling of broad shallow basins left over from the late glacial period. During testing and later during the conservation studies, excavation was terminated in the clay rich (pond sediments) till at depths ranging from 50 cm on the margin of the excavations to 200 cm near the central area of the excavations.

In very broad terms, the stratigraphic profile consists of three major units (Figures 5,6,7,8). The lowermost soil unit contains

a series of paleosols separated by clay rich pond deposits. This unit reflects alternating periods of stability during a period of increased moisture. The depositional period reflected in this unit is believed to represent an anthermal climatic regime which correlates with the early period of Bow River alluvial filling (cf. Wilson 1981). The second broad depositional period is, by comparison, relatively thin and reflects the deficient moisture regime of the Altithermal period. A dominant sedimentary characteristic of this period is the inclusion of a thick Mazama Ash deposit, a stratigraphic time marker on this area of the Plains and a series of paleosols. This period of soil deposition is capped by a faint paleosol which effectively seals Mummy Cave and other Altithermal related cultural materials.

The upper sediments, enclosing both Oxbow/McKean complex materials and Old Woman's Phase cultural materials, again represent a period of higher moisture regime, and in this case, an almost continuous infilling of the basin. Paleosols, where they are present, are only faintly recognizable or absent entirely from this portion of the column.

The stratigraphy of both basins is relatively complex and marked by the affects of faunaturbation and other modifying processes. Relevant profiles from both basins--central areas and the compressed marginal areas--are provided in Figures 5 - 8. Where applicable, these are discussed at greater length in the body of the component descriptions.

The nature of the deposition within the basins is responsible for at least one difficulty with the analyses and interpretation which is not addressed directly within this report. The basin shape of the feature made it necessary to utilize a horizontal and arbitrary datum. Both the surface of the basin and the underlying stratigraphic horizons involved sloped surfaces. Excavations made use of both arbitrary levels and stratigraphic

control. Units, however, were excavated by both floor and, in a conventional manner, by level. Although horizons were generally clear, in some cases their depth was anticipated on the basis of trends established in adjacent units. During the analysis every effort was made to assure that the cultural deposits were treated as being representative of co-associated materials. Sally Stewart, who is presently conducting analyses on the material which includes a consideration of conjoinable pieces, has identified potential areas of concern in the uppermost components (1983:personal communication).

It should be readily apparent that the sloped nature of the deposits, although slight, could, where components are closely spaced in the stratigraphic column, yield mixed assemblages consisting of horizontally stratified cultural deposits if horizontal and arbitrary levels were utilized to the exclusion of good stratigraphic control. This problem should not, however, arise, unless major stratigraphic markers (e.g., the Mazama Ash) were absent.

The integrity of the floor, given the otherwise limited information recovered, is of paramount importance. For this reason, such observations as are necessary to demonstrate such contemporaneity are made wherever it is felt appropriate.

5. COMPONENT DESCRIPTION

For each of the six cultural components identified in the excavation of the Hawkwood Site, EgPm-179, the following categories of information are presented:

a) General Description,
b) Stratigraphic Association,
c) Lithic Descriptions,
d) Faunal Descriptions,
e) Feature Descriptions,
f) Floor Characteristics,
g) Age,
h) Cultural Affiliation,
i) Subsistence,
j) Site Type.

The general description provides a brief overview of the component and provides any introductory comments which are not dealt with in the informational categories which follow.

The stratigraphic association provides comments on the nature of the living floor relative to the soil profile, the depth of the cultural component, and whether a paleosol or other characteristic profile marker is present.

The lithic description provides a detailed breakdown of the various classes of artifacts present, the form of the artifacts, characteristic attributes, appropriate measurements, a description of the lithic type, and listing of their distribution. For each of the formed tool classes, a comparative discussion is presented. Lithic descriptions follow those given

by Reeves (1970 and 1972).

The faunal remains were examined to determine which species were present, the number of individuals present, their age at death, their sex, the seasonality of occupation and the butchering techniques utilized. The species was identified using comparative samples in the comparative mammalian osteology laboratory of the Department of Archaeology at the University of Calgary. Supplementary information was drawn from material published by Olsen (1964). Minimum number of individuals was determined by examination of identifiable elements in comparison with the age of the specimens. Age was determined using tooth eruption and wear as well as epiphyseal fusion rates as diagnostic measures. Sexual dimorphism could not be determined due to a lack of suitable elements for sexing. Butchering units utilized in the faunal descriptions are defined elsewhere.

The feature description provides measurements and provenience information on stone concentrations, hearths and particularly dense concentrations of lithics or other material.

Where available, the age of the component is given in radiocarbon years. Where only diagnostic artifacts are present, the chronological discussion makes reference to comparative archaeological collections or stratigraphic correlations.

The next section deals with cultural affiliation. It provides a brief discussion of sites of similar age, configuration and/or content.

The sections dealing with subsistence provide a more comprehensive discussion of the component and its function. Under the heading of subsistence the butchering patterns are related to the tool kits present and considered in the framework of the location of EgPm-179 and its likely environmental setting

at the time of its occupation.

The site type provides a concise statement of the inferred function of the component.

5.1 PLAINS MOUNTAIN COMPLEX -- COMPONENT I

The lowermost component of the Hawkwood Site was identified exclusively in the East Basin (Figures 9,10,11; Plate 6). In general, the component consists of a wide distribution of artifactual material, a large collection of small fragmentary faunal elements and a substantial number of moderate to large sized imported quartzite cobbles. Although not duplicated in the West Basin during the 1981 excavation, the initial testing carried out in 1979 in that basin resulted in the recovery of large bone fragments from approximately the same stratigraphic position (Head and Smith 1980:61).

5.1.1 STRATIGRAPHIC ASSOCIATION (Figures 5 and 6; Plates 5 and 6)

Component I was found to be associated with a buried paleosol encapsuled by clay rich pond deposits at depths ranging from approximately 120 to 130 cm below the site datum. This paleosol, the third located below the Mazama Ash horizon, is, at least faintly, recognizable throughout the East Basin. There exists a clear stratigraphic separation between Component I and the overlying i.e., component (Figures 5 and 6). Fragments of a single side notched projectile point (N=9) were located in association with the floor in two units and adjacent to a unit containing a Plains Mountain Biface and a Lusk Point. A clear association exists.

5.1.2 LITHIC DESCRIPTION (Table 1)

5.1.2.1 FORMED TOOLS

PROJECTILE POINTS:

UNNOTCHED ATLATL

Lusk (N=1) (Plate 13, No. 1)

Form: The point is regular lanceolate in form with symmetrical, convex lateral edges and a straight basal edge. There is a slight right lateral edge distal skew. The tip is slightly damaged.

Modification: There is complete regular double diagonal pressure retouch on both ventral and dorsal surfaces. Flake scar widths range from 2-3 mm. The base is bifacially thinned and unground.

Metrics:		
	Length	4.0 cm
	Width	2.3 cm
	Thickness	0.8 cm
	Weight	6.9 g

Lithic Type: Pink, heat treated chert.

Distribution: Test 12, Level 12, NE quadrant (Table 1; Figure 10)

Discussion: Chronological associations with Red Rock Canyon (Husted 1969). This point type is believed to have existed between ca. 7000-6000 B.C. The nomin was proposed by Irwin (1967) as a replacement for the Angastura type (Reeves 1972).

SIDE NOTCHED ATLATL

Salmon River Side Notched (N=1) (Plate 13, No. 2)

Form: The body is bilaterally symmetrical with a lanceolate, excurvate form and sharp tip. The right lateral shoulder form is a sharp right angle, the right is broken. The left notch is deep, rounded, the right, broken. The left notch-basal edge juncture is sharp, obtuse, the right broken. The left basal edge is straight and contracting toward the base, the right broken. The left basal edge--basal juncture is sharp acute; the right broken. The base is broken but was probably deeply notched.

Modification: The dorsal surface was pressure flaked, herringbone pattern. The ventral surface was irregularly pressure flaked--the flaking pattern is difficult to determine due to the presence of pot lid removals and heat fractures.

Metrics:	Length	4.6 cm
	Width	2.05 cm
	Thickness	1.65 cm
	Weight	4.9 g

Lithic Type: Red, heat treated chert.

Distribution: Fragments from Test 11, Level 12, SE quadrant; Test 13, Level 12, SW quadrant (Table 1; Figure 10)

Discussion: This example represents an early form of the deep concave base Mountain and Plains form (Reeves 1972) of Swanson and Sneed is Idaho type (Swanson and Sneed 1966). Specimens consisted of nine fragments located in three 2x2 m tests.

STEMMED ATLATL (N=1) (Plate 13, No. 3)

Form: Bilaterally, symmetrical, triangular stemmed projectile point with a slight distal skew at the left lateral edge. The tip is broken. The left shoulder is rounded acute, the right shoulder rounded acute. The stem expands proximally to a convex base.

Modification: The point is bifacially pressure flaked with regular, proximal flake scars. Some cortex remains in the centre of the dorsal surface. The base is bifacially thinned and unground.

Metrics:	Length	3.3 cm
	Width	2.1 cm
	Thickness	0.6 cm
	Weight	3.0 g

Lithic Type: Black pebble chert.

Distribution: Test 13, Level 12, SW quadrant (Table 1; Figure 10)

BROKEN, UNCLASSIFIABLE ATLATL FRAGMENTS

Stemmed Base (N=1) (Plate 13, No. 5)

Form: This fragment consists of a proximally expanding stem and base. The base is concave.

Modification: The fragment is bifacially pressure retouched. The base is bifacially thinned and ground.

Metrics: Length 1.2 cm

Width	1.6 cm
Thickness	0.55 cm
Weight	1.4 g

Lithic Type: Green pebble chert--possibly termoline chert from Rocky Mountain quarry source (B. Reeves 1981, personal communications).

Distribution: Test 5, Level 9, NW (Table 1; Figure 10)

Discussion: This base may be a variant of the Humbolt Stemmed from the Crowsnest Pass, these dated to ca. 6200 B.C. (Reeves 1981, personal communications).

POINT AND MID SECTION (N=1)

Form: This fragment appears to be the right lateral distal end of an asymmetrical lanceolate point which was snapped during manufacture.

Modification: Bifacial pressure retouch.

Metrics:	Length	4.8 cm
	Width	1.6 cm
	Thickness	0.7 cm
	Weight	4.1 g

Lithic Type: Black pebble chert.

Distribution: Fragments from:
Test 5, Level 9, NE quadrant
Test 5, Level 10, NW quadrant (Table 1; Figure 10)

POSSIBLE POINT PREFORM MIDSECTION (N=1) (Plate 13, No. 4)

Form: This fragment is a bifacially worked midsection--possibly a point preform. Both proximal and distal ends are broken.

Modification: Both lateral edges of dorsal surface are pressure flaked--some cortex remains in centre. Sharp edge created on right lateral edge. Ventral surface has complete pressure retouch.

Metrics:		
	Length	3.5 cm
	Width	2.2 cm
	Thickness	0.8 cm
	Weight	9.7 g

Lithic Type: Black pebble chert.

Distribution: Test 6, Level 7, west one-half (Table 1; Figure 10)

POINT TIP (N=1)

Form: This specimen consists of a bilaterally symmetrical lanceolate point tip with a slight distal skew of the right lateral edge.

Modification: Complete bifacial pressure retouch.

Metrics:		
	Length	2.7 cm
	Width	1.9 cm
	Thickness	0.6 cm
	Weight	2.4 g

Lithic Type: Medium-grained, lustrous orange quartzite.

Distribution: Test 5, Level 10, NW quadrant (Table 1; Figure 11)

BIFACES (N=3) (Plate 13, No's. 6-8)

Form: Two examples are symmetrical ovate with straight bases (833, 1148), while one is a symmetrical lanceolate-bipoint (1437).

Modification: All examples exhibit primary hard hammer percussion bifacial retouch and secondary pressure retouch on both lateral edges. All have use wear on at least one lateral edge.

Metrics:	1437	833	1148
Length	14.15 cm	5.8 cm	3.6 cm
Width	4.5 cm	3.6 cm	2.9 cm
Thickness	1.2 cm	1.0 cm	0.5 cm
Weight	75.9 g	22.8 g	7.35 g

Lithic Type: Fine-grained, lustrous quartzite; medium-grained, lustrous pink quartzite; medium-grained, lustrous red quartzite.

Distribution: Test 12, Level 12, NW quadrant; Test 8, Level 10, NE quadrant; Test 9, Level 10, NW quadrant (Table 1; Figure 11)

BIFACE FRAGMENTS (N=1)

Form: Biface tip fragment--possibly symmetrical ovate.

Modification: The fragment exhibits primary hard hammer percussion bifacial retouch. There is some use-wear crushing on the distal end.

Metrics:	Length	3.2 cm
	Width	2.2 cm

Thickness	1.1 cm
Weight	8.0 g

Lithic Type: Medium-grained, lustrous grey quartzite.

Distribution: Test 13, Level 11, SE quadrant (Table 1; Figure 11)

SPLIT PEBBLE END SCRAPER (N=1) (Plate 13, No. 9)

Form: The scraper was made from an ovoid bipolar split pebble.

Modification: The dorsal surface exhibits cortex modified by steep, 70 degree, pressure retouch along the distal end. There is little evidence of use-wear. The ventral surface is unmodified.

Metrics:	Length	6.8 cm
	Width	3.9 cm
	Thickness	1.3 cm
	Weight	35.7 g

Lithic Type: Black pebble chert.

Distribution: Test 9, level 10, NE quadrant (Table 1; Figure 11)

SPALL TOOLS

RETOUCHED SPALL TOOLS (N=1)

Form: Ovoid asymmetrical spall.

Modification: The spall is modified by hard hammer percussion, plus marginal retouch along the distal end of the ventral surface and along the right lateral edge of the distal end of the dorsal

surface to create a cutting edge. Some evidence of use wear.

Metrics:	Length	12.0 cm
	Width	6.8 cm
	Thickness	2.4 cm
	Weight	227.4 g

Lithic Type: Medium grained, lustrous quartzite spall.

Distribution: Test 14, Level 11, NW quadrant (Table 1; Figure 11)

UTILIZED SPALL TOOLS (N=1)

Form: Ovoid asymmetrical spall.

Modification: The spall is modified by wear along both lateral edges and the distal end, ventral surface.

Metrics:	Length	7.6 cm
	Width	3.9 cm
	Thickness	1.5 cm
	Weight	46.1 g

Lithic Type: Medium-grained, lustrous grey quartzite.

Distribution: Test 14, Level 11, SE quadrant (Table 1; Figure 11)

CORE/CHOPPER TOOLS

BIFACIAL (N=1)

Form: Asymmetrical, bidirectional core fragment.

Modification: The fragment is modified by bifacial, pressure retouch along one end to create a cutting edge.

Metrics:	Length	4.1 cm
	Width	3.2 cm
	Thickness	1.8 cm
	Weight	20.9 g

Lithic Type: Grey pebble chert with calcareous inclusions.

Distribution: Test 13, Level 12, SW quadrant (Table 1; Figure 10)

UNIFACIAL (N=2)

Form: One example is made from a split cobble, the other from a large spall.

Modification: Both examples have been modified by unifacial, hard hammer percussion retouch along one lateral edge, or along the lateral edge and distal end to create a cutting edge. Both exhibit some use wear crushing.

Metrics:	Length	11.4 cm	11.5 cm
	Width	5.9 cm	12.2 cm
	Thickness	4.4 cm	4.5 cm
	Weight	473.2 g	629.0 g

Lithic Type: Medium-grained, lustrous purple quartzite; fine-grained, lustrous yellow quartzite.

Distribution: Test 20, Level 10, NW quadrant; Test 10, Level 11, SW quadrant (Table 1; Figure 11)

RETOUCHED FLAKES

LOCALIZED RETOUCHED FLAKES (N=3)

Form and Modification: Two examples are modified by unifacial, marginal pressure retouch on one lateral edge. The other example is bifacially retouched on a lateral edge and distal end. The chalcedony tool shows some evidence of platform preparation, and both the distal end and left lateral edge of the piece are broken.

Metrics:			
Length	1.9 cm	6.1 cm	7.8 cm
Width	1.1 cm	5.6 cm	1.9 cm
Thickness	0.4 cm	1.2 cm	0.5 cm
Weight	0.8 g	46.4 g	1.8 g

Lithic Type: Grey siltstone (N=2); patinated chalcedony (N=1).

Distribution: Test 20, Level 10, SE quadrant; Test 5, Level 9, NE quadrant; Test 6, Level 7, west half (Table 1; Figure 11)

PATTERNED RETOUCHED FLAKES (N=3)

Form and Modification: One example, an expanding secondary flake fragment, is modified by pressure retouch along both extant lateral edges on the ventral surface. The dorsal surface is unmodified. The proximal and distal ends of the piece are broken. The other examples are broken flakes modified by pressure retouch on the distal end, dorsal surface.

Metrics:			
Length	2.0 cm	2.44 cm	4.46 cm
Width	1.5 cm	1.38 cm	1.86 cm
Thickness	0.3 cm	0.50 cm	1.46 cm
Weight	0.8 g	1.2 g	15.0 g

Lithic Material: Black pebble chert (N=1); brown chalcedony (N=2)

Distribution: Test 13, Level 12, SW quadrant; Test 9, Level 8, SE quadrant; Test 12, Level 12, SE quadrant (Table 1; Figure 10)

POSSIBLE GRINDER (N=1)

Form and Modification: Discoid pebble concretion. Pitted over entire surface--possibly used for grinding.

Metrics:		
	Length	2.90 cm
	Width	2.67 cm
	Thickness	2.65 cm
	Weight	37.70 g

Lithic Type: Coarse, dull, pink quartzite concretion.

Distribution: Test 14, Level 11, SE quadrant (Table 1; Figure 11)

5.1.2.2 DEBITAGE

Flake and core debitage comprises 95% of the lithic assemblage. Of this, 8.3% represents cores and core fragments; 12.2% decortication flakes; 15.6% secondary flakes; 53.4% shatter and nonidentifiable flakes. The large percentage of cores, core fragments and decortication flakes suggests that primary core reduction, as well as all other stages of tool manufacture were taking place at the site.

5.1.2.3 LITHIC TYPES (Table 3)

MICROCRYSTALLINES

QUARTZITE

Quartzite tool and debitage comprise 59.7% (N=282) of the lithic assemblage. Of this, 3.5% (N=10) were tools. Local quartzite cobbles are readily available from the surrounding glacial till. These quartzites come in a variety of colors, ranging from browns through reds, oranges, yellows, greens, and purples. Flaking quality ranges from good in the fine-to medium-grained lustrous examples, to fair/poor in the coarser grained, dull varieties.

QUARTZ CRYSTAL

Quartz debitage comprises only 0.42% (N=2) of the lithic assemblage. There were no formed tools of this material. The quartz was coarse-grained, held veined quartzite inclusions and was of very poor flaking quality. The poor quality suggests that the material was locally available but generally not exploited.

CRYPTOCRYSTALLINES

SILTSTONE

Siltstone tools and debitage comprise 20.1% (N=95) of the assemblage. Only 2.1% (N=2) were formed tools. The material ranges from grey through brown in color and is of fair to good flaking quality. It was probably locally available in limited amounts from glacio-fluvial pebble.

PEBBLE CHERTS

Pebble chert tools and debitage comprise 15% (N=71) of the lithic assemblage. Of this material, 9.9% were formed tools. These pebble cherts were predominantly black, green, brown or grey in color and were of excellent flaking quality. All, with the possible exception of the green chert were locally available. This green chert may be termoline chert, imported from the Rocky Mountains. It is found only in this component, occurring on a point base and as retouch flakes (N=16).

PASKAPOO CHERT

Paskapoo chert comprises only 1.5% (N=7) of the debitage. There were no tools of the material in the assemblage. The chert is available regionally in the Paskapoo glacial formation.

CHALCEDONY

Chalcedony are translucent fibrous, silicates with a waxy lustre. The examples in this assemblage range from brown through red in color and are of excellent flaking quality. The tools and debitage comprise only 2.3% (N=11) of the assemblage, 27.2% (N=3) of this being tools. Some examples retain a worn cortex which suggest that they originated from a glacio-fluvial source, possibly local.

PETRIFIED WOOD

Petrified wood debitage comprise only 0.2% (N=1) of the total lithic assemblage. The single example was brown, blocky and of fair flaking quality. Petrified wood occurs secondarily in gravels and Cretaceous sediment. This sample was probably locally obtained.

LIMESTONE

Limestone debitage comprise only 0.2% (N=1) of the assemblage. The single example was of fair to good flaking quality. Source is unknown.

HEAT-TREATED CHERT

Heat-treated chert accounted for only 0.41% (N=2) of the total lithic assemblage. Both examples were tools. The heat-treating process altered the color of the original chert to red in one example and pink in the other. The chert was of excellent flaking quality, and judging from the total lack of associated debitage in the assemblage, probably was an import, possibly from one of a number of sources in central Montana (Reeves: Pass Creek).

Of the 24 formed tools identified in this component (only 5% of the total lithic assemblage) all, with the possible exception of the two complete projectile points, were manufactured from local materials.

The projectile point fragments were manufactured from local pebble cherts (N=4) or local quartzite (N=1). The bifaces were manufactured from local quartzite; the scraper from pebble chert and the retouched flakes from chert (N=1), siltstone (N=2) or chalcedony (N=3). The possible grinder and large stone tools were made from local quartzite, with the exception of a single core/chopper of chert.

There is an obvious dichotomy in material selection for tool types. Small formed tools; the projectile points, scraper and retouched flakes; are all, with the single exception of a quartzite point fragment, manufactured from cryptocrystalline materials, which exhibit greater flaking control properties than

the microcrystallines. The bifaces, spall tools and large stone core choppers are manufactured from lustrous fine- and medium-grained quartzites, which while not exhibiting the same flaking control as the cryptocrystallines, will hold a working edge longer. While a variety of quartzite grades are represented in the lithic debitage (fine- through coarse-grained and dull to lustrous) only the lustrous, fine- to medium-grained quartzites appear to have been selected for tool manufacture.

In contrast to the lithic materials selected for tool manufacture, the majority of the debitage (61.1%) (N=27) consists of microcrystalline quartzites. This large proportion of quartzite debitage in comparison to the amount of formed quartzite tools (N=10) suggests that decortication flakes, secondary flakes and possibly core fragments may have functioned as expediency, throw away tools. Quartzite cobbles were readily available from the local glacial till, which might explain the preference for easily manufactured expediency tools, over the highly curated cryptocrystalline tools. This situation may also hold true for the siltstones. Siltstone comprises 20.7% (N=93) of the lithic debitage. Many of these flakes may also have been used as expediency tools, although the siltstone does not appear to be as readily available and is generally of a rather poor quality for holding a working edge. Other cryptocrystallines (cherts, chalcedony, limestone, and petrified wood) account for 17.6% (N=79) of the lithic debitage, 62.0% (N=49) of which is thinning and retouch flakes. This cryptocrystalline debitage is likely solely a result of tool manufacture. All flakes are extremely small and exhibit no evidence of use wear.

5.1.3 FAUNAL DESCRIPTION

5.1.3.1 SPECIES REPRESENTED

Only bison was identified.

5.1.3.2 MINIMUM NUMBER OF INDIVIDUALS, AGE, SEX AND SEASONALITY

One mature bison was represented. The age was more than two to three years as determined from the fused second phalanges, but sex and seasonality could not be determined.

5.1.3.3 BUTCHERING TECHNIQUES (Tables 13-27)

Component 1 contained the greatest amount of faunal material with 1479 unidentifiable fragments weighing 840.6 g. There were also 730 burned fragments (442.7 g) and 146 calcined fragments (86.1 g). Most were highly fragmented which is normally interpreted as indicative of marrow extraction. The calcined fragments may also indicate the use of bones as a fuel source.

Cranial elements, except 38 tooth fragments (20.2 g), were absent. The lack of heavy, non-meaty elements (skull, vertebrae, scapula, pelvis) is normally interpreted as indicating that these were discarded at the kill site and only the stripped muscles and limbs were returned to the site. No ribs were identified in the faunal remains, so the meat was probably also stripped from these.

The forelimb was represented by two humeral fragments: a distal anterior/medial shaft fragment (BU-43) and a fragment of the medial condyle (BU-35). The humerus is an important marrow bone, and these fragments could have resulted from marrow extraction. The absence of identifiable radius or metacarpal fragments may also be due to their use in marrow extraction.

The hind limb was represented by two femural anterior and

posterior shaft fragments (BU-9, BU-10), the anterior process of a calcaneum (BU-14) and a metatarsal proximal, posterior shaft fragment (BU-10). The presence of these fragments would indicate the hind limb was brought in articulation to the site for further reduction. The femoral and metatarsal fragments suggest the bones were reduced for marrow extraction.

One first phalanx and three second phalanges were also present, suggesting articulated limbs were brought to the site. The absence of third phalanges may be due to their use in the production of glue.

5.1.3.4 DISTRIBUTION

The greatest amount of faunal material in Component 1 was found in an elliptical area extending from the northeast quadrant of Test 18 and southwest quadrant of Test 8. This area contained about 68% of unburned and burned fragments, and 83% of calcined fragments. Most calcined fragments (42%) were in the southwest quadrant of Test 8 and the southeast quadrant of Test 13. This was found to be a hearth area. Calcined material was also prevalent in the northeast quadrant of Test 18 (14%).

5.1.4 FEATURE DESCRIPTIONS (Figure 9)

Thirty-eight moderate to large sized, quartzite cobbles were found to lie on the living floor. The distribution of the cobbles is significantly non-random. With the exception of a very small number of fist sized outlying stones, the cobbles form three relatively distinct clusters. The first is composed of moderate sized cobbles which form a semi-circular arrangement over the area of Test #20 on the southeast corner of the excavated living floor (Figure 9). A second concentration, more diffuse in distribution and made up of smaller stones, is located in the east central area of the site in Tests numbered 5, 8, and

9. A third cluster of cobbles is located in the northernmost unit in the East Basin. The three clusters are clearly associated with the north and eastern halves of the basin. Presumably, these represent the remains of hold downs for one or more shelters.

At least two hearth features appear to be present. The first hearth is characterized by small unidentifiable fragments of burned and calcined bone, soil staining and a thin scattering of charcoal. It is present across the boundary of Tests 8 and 13. The hearth is elongate and measures 1.5 metres along the east-west axis and 50 cm along the north-south axis. A second hearth feature is located in Test number 18 at the southwest corner of the East Basin excavations. It, too, is characterized by concentrations of burned and calcined bone. The hearth measures approximately 40 cm by 20 cm. It, too, is elongate.

5.1.5 FLOOR CHARACTERISTICS

The analysis of spatial structure on the living floor is not here taken beyond the descriptive stage. The provenience data does, however, support the presence of distinctive activity patterning.

The two hearths noted above lie outside of areas suggested to represent shelters. In the first case, the hearth is located between two stone features in the northern area of the excavation (Unit 21). In the second case, the hearth lies well to the west of the stone feature located on the southern margin of the excavations (Unit 20) (Figure 9).

Based on the small number of formed tools in the assemblage and the apparent homogeneous distribution over the site, it is difficult to suggest any correlation between tools or between tools and debitage. Many of the small, cryptocrystalline formed tools, however, were associated with the greatest density of

cryptocrystalline debitage--especially retouch and thinning flakes (Tests 5, 6, 8 and 9) (Figure 10). There were also numerous decortication flakes and cores, suggesting that the majority of cryptocrystalline tool manufacture occurred in this vicinity. The only projectile points not associated with this cluster were those manufactured from imported materials. There is virtually no debitage associated with these tools (Test 13). Lithic debitage and tools in the remainder of the site were found to be extremely thinly scattered.

The quartzite tool and debitage distribution (Figure 11) is less densely clustered, although the heaviest concentration of debitage (especially retouch and thinning flakes) is located in the same area as the cryptocrystalline tools (Tests 5, 8 and 9). The few quartzite tools are roughly grouped around this concentration. This dense lithic concentration is surrounded by an arc of large quartzite rocks which may have provided some shelter for a "workshop" area. There was very little bone found in this area. Generally, bone and charcoal concentrations were associated with very thin lithic scatters. Two charcoal and bone concentrations may be hearths. Test 20 exhibits a dense concentration of bone, charcoal and unworked stone but a paucity of tools or lithic debitage. This area may represent a scattered hearth (Figure 9).

5.1.6 AGE

A radiocarbon assay on bone collegen drawn from the faunal sample was calculated to be 8250 +/- 330 B.P., 6300 B.C. (RL-1554). In spite of the relatively high standard deviation the calculated date falls well within the range of anticipated dates for the affiliation posited below.

5.1.7 CULTURAL AFFILIATION

Diagnostic artifacts (projectile points) and C14 dates place this component at ca. 8250 B.P. No comparable Late/Early Prehistoric campsites have been excavated in the Calgary area. The nearest campsite of comparable date is DjPp-3 in the Crowsnest Pass, ca. 8000 B.P. (Ptolemy Subphase) (Loveseth 1980:40)--phase association--Plains/Mountain (Reeves 1979). Comparison of this site to Component 1 at EgPm-179 indicates that similar diagnostic tools; projectile points, bifaces, large unifaces and retouched flakes; were present in both. Both components also utilized predominantly local lithic materials (Loveseth 1980). The diagnostic tools clearly suggest that Component 1 at Hawkwood relates culturally to the Plains/Mountain Phase as represented at DjPp-3, but the extreme paucity of formed tools make such comparisons highly tentative. At Hawkwood hearths are present--unlike at DjPp-3. Such an identification places the Hawkwood occupation in the same cultural continuum as subphases and components on the eastern slopes of the Rocky Mountains at ca. 8250 B.P. (Reeves 1973).

The Salmon River Side Notched point casts some confusion on the attribution. This point, however, was not intrusive as it was pieced back together from specimens recovered from several contiguous units.

5.1.8 SUBSISTENCE

The identifiable bone fragments argue for the sole utilization of bison. The location of the site argues against carcass reduction in the immediate vicinity of the site. The butchering units present conform to this interpretation. The nature of the terrain suggests the possibility of the inhabitants having utilized the various nearby sloughs as traps. For various reasons, discussed elsewhere, this suggests the presence of only

small herds of bison, the use of stalking as the primary hunting strategy and the existence of disparate activity areas (i.e., primary carcass reduction) taking place nearby but the manufacture of large stone cutting tools taking place on site.

5.1.9 SITE TYPE

The archaeological evidence suggests the presence of a campsite which was occupied for a short period of time by a small group of people, perhaps only one or two families. The location of the activity areas relative to the posited shelters suggests that the site was occupied during relatively mild weather. On the other hand, our knowledge of bison distribution suggests a possible winter utilization of the Nose Hill Uplands.

5.2 COMPONENT 2 (Plates 4 and 7)

Component 2 was identified in the West Basin only. In general the component consists of a large number of heavy stone tools complemented by a moderate series of unifaces and bifaces. Debitage consisted of similar percentages of decortication flakes and secondary flakes (22.4% and 22.7% respectively). Retouch and thinning flakes constituted a somewhat larger percentage than either of the above (35.1%). Clear evidence of features is lacking; however, there exists at least one concentration of natural cobbles and cobble core artifactual material.

5.2.1 STRATIGRAPHIC ASSOCIATIONS (Figures 7 and 8)

Component 2 was found to be associated with a buried paleosol, the second of three such paleosols which underlie the Mazama Ash horizon. The artifactual material associated with this living floor occurs between 32 cm below the surface datum on the compressed margins of the excavation and 113 cm below the surface datum near the centre of the excavations where stratigraphic

separation is greatest. This paleosol, as with those lying above and below, was recognized in both of the basins which were excavated.

5.2.2 LITHIC DESCRIPTION (Table 2)

5.2.2.1 FORMED TOOLS

BIFACES (N=3) (Plate 14, No's. 1-3)

Form and Modification: All three examples are asymmetrical ovate in form, with straight left lateral edge and deeply convex right lateral edge (N=1) or straight right lateral edge and deeply convex left lateral edge. One example exhibits a deep basal notch, which was probably accidental. All have pointed tips and straight bases.

Two examples are modified by convex, bifacial hard hammer retouch overall and use wear on the convex (presumably the working edge) lateral edge. The other is modified by careful primary hard hammer retouch over the entire piece, and by soft hammer retouch and use wear along the convex lateral edge.

Metrics:	Length	7.6 - 8.3 cm
	Width	3.8 - 4.5 cm
	Thickness	1.0 - 1.4 cm
	Weight	32.4 g

Lithic Type: Fine, lustrous quartzite (N=3).

Distribution: (Table 2; Figures 13 and 14)

SCRAPERS

END SCRAPERS (N=4) (Plate 14, No's. 4-7)

Form and Modification: All examples are secondary flakes, ovoid in shape and modified by steep pressure retouch along the distal margin.

Metrics:		
	Length	1.8 - 3.4 cm
	Width	1.4 - 2.5 cm
	Thickness	0.6 - 0.9 cm
	Weight	1.4 - 6.5 g

Lithic Type: Black pebble chert (N=2); petrified wood (N=2)

Distribution: (Table 2; Figures 13 and 14)

SPLIT PEBBLE SCRAPER (N=1)

Form and Modification: Split pebble modified by crude, steep hard hammer retouch along one lateral margin.

Metrics:		
	Length	5.2 cm
	Width	4.1 cm
	Thickness	2.6 cm
	Weight	54.0 g

Lithic Type: Fine, lustrous quartzite.

Distribution: (Table 2; Figures 13 and 14)

SPALL TOOLS (N=1)

UTILIZED

Form and Modification: Large cortical spall modified by use wear crushing along a single lateral margin.

Metrics:		
	Length	11.9 cm
	Width	8.3 cm
	Thickness	2.3 cm
	Weight	206.1 g

Lithic Type: Fine, dull quartzite.

Distribution: (Table 2; Figures 13 and 14)

LARGE CORE/CHOPPER (N=11) (Plate 15:8)

Form and Modification: All examples are large cobbles modified by steep, unifacial hard hammer percussion retouch along one lateral margin (N=5); unifacial retouch extending over the entire "dorsal" surface (N=3) or bifacial retouch along one lateral margin (N=3). All forms of modification created a sharp cutting/scraping edge. All exhibit some evidence of use wear crushing.

Metrics:		
	Length	15.3 - 25.6 cm
	Width	7.7 - 17.8 cm
	Thickness	4.5 - 8.4 cm
	Weight	994.8 - 3250.0 g

Lithic Type: Fine, lustrous quartzite (N=1); medium, lustrous quartzite (N=7); coarse, dull quartzite (N=3).

Distribution: (Table 2; Figures 13 and 14)

RETOUCHED FLAKES

PATTERNED RETOUCHED FLAKES (N=5)

Form and Modification: All examples are secondary flakes modified by unifacial soft hammer retouch along two lateral edges, (possible drills, N=3) or bifacial retouch along one lateral edge (possible wedges, N=2).

Metrics:		
	Length	1.5 - 5.5 cm
	Width	1.3 - 4.3 cm
	Thickness	0.2 - 1.0 cm
	Weight	0.6 - 16.5 g

Lithic Types: Fine, lustrous quartzite (N=1); black pebble chert (N=2); grey pebble chert (N=1); petrified wood (N=1).

Distribution: (Table 2; Figures 13 and 14)

HAMMERSTONE (N=1)

Form and Modification: Ovoid cobble modified by battering at each end.

Metrics:		
	Length	10.1 cm
	Width	7.8 cm
	Thickness	4.8 cm
	Weight	540.8 g

Lithic Type: Coarse, dull quartzite.

Distribution: (Table 2; Figures 13 and 14)

5.2.2.2 LITHIC TECHNOLOGY (Table 4)

TOOLS

Formed tools represent only 5.8% (N=21) of the total lithic assemblage. All are manufactured from locally available quartzites (80.9%, N=17); pebble cherts (9.5%, N=2) or petrified wood (9.5%, N=2). In contrast to all other components at this site, there does not appear to be a selection for fine-grained lustrous quartzites for the formed tools. This is likely due to the fact that a large proportion of these tools were heavy core choppers, probably used for cutting and scraping in butchering and hide processing. For material selection, flaking quality would not be as significant as obtaining large, readily available cobbles, which would be easily manufactured.

DEBITAGE

Proportions of core and flake debitage represented in the assemblage suggest that all stages of lithic manufacturing were occurring at the site (cores and core fragments: 2.4%, N=8; decortication flakes 20%, N=68; secondary flakes 22.7%, N=77); thinning and retouch flakes 35.1% (N=119), and shatter and nonidentifiable flakes 19.7% (N=67). As in other components in the West Basin, there are significantly higher proportions of shatter and nonidentifiable flakes than in the East Basin components.

5.2.2.3 LITHIC TYPES

QUARTZITES

Local quartzites comprise the vast majority of the lithic assemblage--74.7% (N=269). Of this, 23.8% (N=64) is fine-grained; 26.0% (N=70) medium-grained, and 50.2% (N=135)

coarse-grained. The high proportion of coarse-grained quartzite suggests that cobbles of this quality were readily available and were being exploited for the manufacture of expediency tools--flakes and large core chopping/scraping tools.

SILTSTONE

Local siltstone represented only 2.7% (N=10) of the collection. There were no formed tools of this material.

PEBBLE CHERTS

Local pebble cherts represented 11.9% (N=43) of the collection. Much of this probably was tool manufacture debitage (20 [46.5%] were thinning and retouch flakes).

CHALCEDONY

Only two examples of this material were found. The source was probably local.

PETRIFIED WOOD

Petrified wood represented 9.4% (N=34) of the total assemblage. This component exhibits the largest collection of this material on the site. Source was probably local.

QUARTZ CRYSTAL

Only one example of this material was found. It was of extremely poor flaking quality, and the material, probably local, was not actively exploited.

SWAN RIVER CHERT?

Only one example of this material was found. Its identification as Swan River Chert is somewhat dubious.

5.2.3 FAUNAL DESCRIPTION

5.2.3.1 SPECIES REPRESENTED

Bison and deer were represented. The deer (Odocoileus sp.) was indicated by the tip of an antler tine and three fragments of a cervical vertebrae.

5.2.3.2 MINIMUM NUMBER OF INDIVIDUALS, AGE, SEX AND SEASONALITY

Two mature bison were indicated by the presence of two right astragali. Small unidentifiable fragments of fetal material indicated that one fetus was present. The presence of fetal material, at least, one bison was female. The tuber calcis of the calcaneum that articulated with one astragalus was fused which would indicate one bison was over four years of age.

The presence of fetal material suggests a winter kill/occupation. The tip of an antler tine could also indicate a winter kill as younger bucks of white tail deer keep their antlers until early February (Banfield 1974, p. 392), and mule deer retain theirs until mid January to mid April (Banfield 1974, p. 388).

5.2.3.3 BUTCHERING TECHNIQUE

Faunal remains from Component 2 were made up of 403 unidentifiable fragments (322.0 g). Of these, 176 were burned (132.2 g) and 12 were calcined (9.1 g).

Only the hind limb was represented in Component 2. Hind limb

elements were one distal tibia with about one third of the anterior shaft (BU-10), two slightly butchered astragali (BU-2, BU-15) and one calcaneum with the tuber calcis partially removed (BU-11). Though badly weathered, the tibia, calcaneum and one astragalus seemed to form an articular unit. This would suggest that the hind limbs were probably returned to the site in articulation. The limb may have been butchered between the astragalus and navicular cuboid which could account for the hacked/butchered astragali. This region of segmentation could also account for the absence of identifiable extremity fragments (metapodials, phalanges).

It is also possible the limb elements were fragmented during the extraction of bone marrow, making identification impossible. The presence of bone fragments may also indicate this, although the four identifiable elements weighed more than all the fragments (431.7 g to 322.0 g) suggesting a lack of bone material to begin with.

The lack of cranial, vertebrae or fore limb fragments (except for six small tooth fragments 3.6 g) may represent the use of the "light" butchering technique whereby the heavy elements were left at the kill site after the meat was stripped from them, and only meatier, light elements returned to the campsite. From this, we could possibly assume the kill site was a moderate distance from EgPm-179.

5.2.3.4 DISTRIBUTION

Most of the faunal material in Component 2 was found in the east half of the West Basin. Unit 3N2W contained the most material with about 22% of all fragments. Units 3N6W and 2N7W contained 23% of all material, and Unit 5N4W contained 11%. These units contained the most burned bone (72%).

This would possibly suggest a proximity to a hearth or a marrow extraction area such as that possibly represented by 3N4W which contained 75% of all calcined material.

5.2.4 FEATURE DESCRIPTIONS (Figure 12)

Eleven fist to cobble sized quartzite stones were found to lie on the living floor. The eight cobble sized stones are relatively dispersed across the excavated floor area. Four of the stones form an east-west trending arc in the northeasternmost corner of the excavations. Hearths or other features were notably absent from the excavated floor. Concentrations of bone, as noted above, and concentrations of artifactual material suggest the presence of activity areas as noted below.

5.2.5 FLOOR CHARACTERISTICS (Figures 13 and 14)

The analysis of spatial structure on the living floor is not here taken beyond the descriptive stage. The provenience data only suggests activity patterning.

As with other components in the West Basin, the linear nature of the excavation unit makes identification of spatial patterning difficult. Nevertheless, the eastern portion of the basin exhibits two possible activity areas, a core reduction area in the northeast (as suggested by the concentration of lithic debitage and unworked quartzite cobbles) and a butchering area just to the south and west, as indicated by the concentration of quartzite bifaces, large chopping tools and bone fragments.

The concordance of bone and lithics as noted above suggests the carcass processing activities may have involved the production of expedient tools. The concordance of cobbles lying in an arc, faunal material and, as noted above, a concentration of unworked quartzite cobbles, cobble cores and debitage in the

northeasternmost corner of the excavations more clearly suggest the presence of an activity area.

5.2.6 AGE

A radiocarbon age calculation for Component 1 on material from the third paleosol below the Mazama horizon and available dates for the age of the Mazama horizon suggest a tentative date of between 6500 B.C. and 4500 B.C. Acquired dates of 7030±210 (RL-1276) and 6820±280 (RL-1277) apply to the floor although the earlier date was recovered from a lower level and run on bone appetite.

5.2.7 CULTURAL AFFILIATION

The predominant form of tool from this component, the large core tools, do not provide specific cultural or chronological information. It is likely that these heavy tools were used in general butchering and meat processing as chopping and scraping implements throughout antiquity. Rather than attributing the assemblage to a cultural phase known to exist within the region during the appropriate span of time, we have chosen to leave the affiliation as unknown.

5.2.8 SUBSISTENCE

The distribution of faunal material is, almost without exception, confined to the eastern half of the living floor. The distribution is more or less evenly dispersed with concentrations occurring in the northeast and central areas of the living floor. Both deer and bison were present. The deer was represented by a small number of elements which formed a compact distribution near the centre of the excavated floor. It is possible that this distribution is the result of scavenging or perhaps along with associated artifactual material represents a separate episode of

use.

Of the two bison represented, one was mature, approximately four years old. The two bison are calculated on the basis of two right astragali. Fetal material was also present.

The astragali are of generally low utility and probably were returned to the site coincidentally with the hind limb elements which appear to have been articulated. The presence of the second astragalus is perplexing as the amount of bone present does not suggest the presence of the second hind limb. The burned and calcined bone is not complemented by the presence of hearth staining, fire broken rocks or other circumstantial evidence of, for example, bone grease preparation. Marrow extraction no doubt occurred in conjunction with the consumption of meat associated with the right rear bison limb.

The presence of the fetal material suggests a winter utilization of the site.

Together this information suggests that the site represents a hunting camp located near a bison kill of unknown proportions. The site was probably occupied by one or more hunters without their accompanying families. The bison, killed elsewhere, were lightly butchered in order to meet the immediate consumption needs of the hunters involved. The fetus, commonly thought to be a delicacy, was probably also removed to the camp. Heavy butchering and processing was likely being carried out at the site of the kill. The circumstantial evidence also suggests that the residential camp to which the hunters were attached, if such was the case, was located at some distance from the hunting camp, and not on the Nose Hill Uplands.

5.2.9 SITE TYPE

The archaeological evidence suggests the presence of a transitory hunting camp and a nearby kill site which was being utilized during the winter. The apparent over-representation of processing tools is accounted for by the manufacturing requirements of producing tools for the processing of bison taking place elsewhere. The low density of artifactual materials and the lack of clear features complements this interpretation.

5.3 COMPONENT 3 (Plates 5 and 6)

The distribution of artifactual material which is attributed to Component 3 was restricted to the living floor immediately underlying the Mazama Ash horizon in the East Basin. The assemblage consists of 25 formed tools and 360 debitage specimens. The assemblage is heavily weighted towards spall tools, hammerstones and retouched flakes. This relatively small collection is complemented by a large number of unmodified quartzite cobbles which appear to exhibit a distinctive pattern of distribution. The faunal assemblage contained evidence of a single bison and a canid, but failed to yield evidence of seasonality or sex.

5.3.1 STRATIGRAPHIC ASSOCIATIONS (Figures 5 and 6)

Component 3 was found to be associated with the first buried paleosol underlying the Mazama Ash horizon in the East Basin. The artifactual material associated with the living floor was encountered between approximately 90 cm on the north side of the excavations and 120 cm on the south side of the excavations. Compression of the living floors on the margins of the excavations in the East Basin was found to be minimal. At its deepest point, near the central area of the excavation, the living floor was encountered at a depth of approximately 130 cm

below the surface datum.

5.3.2 LITHIC DESCRIPTIONS (Table 1)

5.3.2.1 FORMED TOOLS

PROJECTILE POINT TIP (N=1) (Plate 16, No. 1)

Form and Modification: Asymmetrical-triangular point tip fragment with a straight right edge and concave left edge with extreme distal skew. Both extant lateral edges exhibit bifacial pressure retouch.

Metrics:	Length	3.5 cm
	Width	2.4 cm
	Thickness	1.6 cm
	Weight	3.3 g

Lithic Type: Avon chert.

Distribution: Test 12, Level 10, NW quadrant (Table 1; Figure 16)

Discussion: The point tip is too fragmentary to allow for chronological and cultural association. It was, however, made of an imported material from the Avon chert quarry southwest of Helena, Montana. It is the single example of this lithic type in the assemblage.

BIFACES (N=2) (Plate 16, No's. 2 and 3)

Form: Both examples are symmetrical ovate in form. One has a pointed distal end and unmodified proximal end (striking platform). The other exhibits rounded tips at the proximal and distal ends.

Modification: Both examples have been modified by complete bifacial, primary hard hammer percussion retouch and secondary bifacial soft hammer percussion retouch along both lateral edges. Some cortex remains on the dorsal surface, right lateral and proximal end of one example. There is use wear polish on both lateral edges.

Metrics:			
	Length	9.2 cm	7.6 cm
	Width	5.1 cm	4.3 cm
	Thickness	1.3 cm	0.9 cm
	Weight	72.9 g	30.0 g

Lithic Type: Fine, lustrous green quartzite; fine, lustrous purple quartzite.

Distribution: Test 12, Level 9, SW quadrant; Test 15, Level 10, NE quadrant (Table 1; Figure 17)

BIFACE TIP FRAGMENT (N=1)

Form: The piece, a distal end, is symmetrical, rectangular in form with a slight right distal skew.

Modification: Soft hammer bifacial retouch. Some use wear crushing on the lateral edges and distal end.

Metrics:		
	Length	3.8 cm
	Width	3.4 cm
	Thickness	1.7 cm
	Weight	9.1 g

Lithic Type: Grey banded siltstone.

Distribution: Test 12, Level 9, SW quadrant (Table 1; Figure 16)

SIDE SCRAPER (N=1)

Form and Modification: This tool is an ovoid pebble modified by steep pressure retouch along one lateral edge--dorsal surface.

Metrics:		
	Length	2.5 cm
	Width	1.9 cm
	Thickness	1.3 cm
	Weight	5.5 g

Lithic Type: Brown chalcedony.

Distribution: Test 20, Level 7, NW quadrant (Table 1; Figure 16)

SPALL TOOLS

RETOUCHED (N=7)

Form and Modification: All examples are cortical, ovoid spalls modified by unifacial hard hammer retouch on the ventral surface. Unifacial secondary retouch and use wear is exhibited on the distal end (N=2); both lateral edges and distal end (N=1); one lateral edge (N=2). Bifacial retouch on a single lateral edge is evident in one example.

Metrics:						
	Length	10.5 cm	5.4 cm	10.1 cm	6.47 cm	11.75 cm
	Width	4.5 cm	3.4 cm	7.2 cm	3.64 cm	7.81 cm
	Thickness	1.4 cm	0.9 cm	2.5 cm	1.19 cm	1.92 cm
	Weight	64.1 g	19.8 g	201.0 g	35.4 g	160.4 g

Length	10.3 cm	4.65 cm
Width	8.0 cm	3.31 cm
Thickness	2.8 cm	0.48 cm
Weight	189.9 g	30.7 g

Lithic Type: Grey siltstone; medium-grained, lustrous grey quartzite; coarse, dull white quartzite; fine, lustrous green quartzite; grey siltstone; fine, dull grey quartzite; medium, lustrous green quartzite.

Distribution: Test 13, Level 10, SW quadrant; Test 11, Level 9, NW quadrant; Test 6, Level 5, NW quadrant; Test 12, Level 9, SW quadrant; Test 20, Level 8, SW quadrant; Test 20, Level 8, NW quadrant; Test 4, Level 6 (Table 1; Figure 16 and 17)

LARGE STONE CORE/CHOPPERS

BIFACIAL (N=2)

Form and Modification: Both examples are core cobbles modified by bifacial, hard hammer retouch of one "lateral" edge and end to create a sharp, cutting edge. The remainder of the tool consists of unmodified cortex. Neither example exhibits any obvious use wear.

Metrics:		
Length	9.7 cm	15.0 cm
Width	7.9 cm	8.7 cm
Thickness	3.8 cm	5.5 cm
Weight	302.8 g	796.8 g

Lithic Type: Fine, dull pink quartzite; medium, dull white quartzite.

Distribution: Test 7, Level 6, SW quadrant; Test 12, Level 9, SW quadrant (Table 2; Figure 17)

UNIFACIAL (N=1)

Form and Modification: This tool was formed from a core cobble modified by unifacial, hard hammer retouch to create a steep cutting edge. There is some evidence of use wear crushing.

Metrics:		
	Length	14.5 cm
	Width	12.4 cm
	Thickness	5.0 cm
	Weight	1280.7 g

Lithic Type: Coarse-grained, medium lustre quartzite.

Distribution: Test 10, Level 9, NE quadrant (Table 1; Figure 17)

RETOUCHED FLAKES

LOCALIZED (N=25)

These examples all exhibit marginal pressure retouch along one lateral edge, dorsal surface (N=2); right lateral edge, ventral surface (N=1); proximal end and right lateral edge, ventral surface (N=1). A single example exhibits marginal bifacial retouch on the distal end to form a very crude wedge shaped surface--possibly a blank for a drill or perforator.

Metrics:						
	Length	3.1 cm	1.5 cm	2.9 cm	2.0 cm	3.2 cm
	Width	1.8 cm	3.0 cm	2.8 cm	1.2 cm	1.9 cm
	Thickness	1.0 cm	0.6 cm	0.3 cm	0.3 cm	0.7 cm
	Weight	6.5 g	2.8 g	4.2 g	0.9 g	4.0 g

Lithic Type: Brown chert pebble; coarse, lustrous white quartzite; fine, grey lustrous quartzite; brown chalcedony; green pebble chert.

Distribution: Test 9, Level 6, SE quadrant; Test 9, Level 6, NE quadrant; Test 8, Level 7, west half; Test 8 Level 8, west half; Test 20, Level 8, SE quadrant (Table 1; Figure 16 and 17)

PATTERNED (N=1)

Form and Modification: This tool is a secondary flake modified by steep, pressure retouch along the left lateral edge, dorsal surface.

Metrics:		
	Length	4.6 cm
	Width	4.5 cm
	Thickness	1.6 cm
	Weight	10.5 g

Lithic Type: Grey, banded siltstone.

Distribution: Test 16, Level 11, SW quadrant (Table 1; Figure 16)

HAMMERSTONE (N=4)

Form and Modification: All examples are coarse, quartzite cobbles which are ovoid in shape and unmodified except by battering wear at one (N=2) or both (N=2) ends.

Metrics:					
	Length	6.38 cm	7.67 cm	9.26 cm	7.80 cm
	Width	5.71 cm	6.52 cm	7.21 cm	5.06 cm
	Thickness	4.68 cm	7.09 cm	5.85 cm	4.24 cm
	Weight	242.2 g	379.3 g	548.9 g	237.7 g

Lithic Type: Coarse to medium-grained quartzite (N=4).

Distribution: Test 12, Level 9, quadrant(?); Test 13, Level 10, NW quadrant; Test 13, Level 10, SE quadrant; Test 16, Level 9, SE

quadrant (Table 1; Figure 17).

5.3.2.2 LITHIC TECHNOLOGY (Table 5)

TOOLS

Of the 25 formed tools identified in this component (6.4% of the tool lithic assemblage) all, with the exception of the single projectile point fragment, were manufactured from local materials. The bifaces were manufactured from local quartzite (N=2) or siltstone (N=1); the scraper from chalcedony; the spall tool from quartzite (N=5) or siltstone (N=2); the chopper from quartzite (N=3); the retouched flakes from quartzite (N=2); chert (N=3) or chalcedony (N=1) and the hammerstone from quartzite (N=4). There is not the obvious bias in material selection for formed tools that was exhibited in Component 1. This may have been a reflection of the availability of suitable materials. The majority of tools (80%, N=20) were manufactured from quartzite (N=16) and siltstone (N=4) which do not exhibit the same flaking control and quality found in the cherts and chalcedonies. The selection of fine- to medium-grained, lustrous quartzite seen in Component 1 is not as evident here, although there is still a preference for lustrous quartzites with a higher silica content (see Appendix I).

DEBITAGE

Flake and core debitage comprises 93.4% (N=360) of the total lithic assemblage. Of this, 6.7% (N=24) represents cores and core fragments; 15.3% (N=55) decortication flakes; 24.7% (N=89) secondary flakes; 37.5% (N=135) thinning and retouch flakes and 15.8% (N=57) shatter and nonidentifiable fragments. This proportion of debitage suggests that all stages of lithic manufacture were undertaken at the site.

In contrast to the situation in Component 1, the selection of materials for tool manufacture is reflected in the debitage. There is, however, a similar occurrence of large quantities of quartzite debitage (N=279) in contrast to the amount of formed tools (N=16). Much of this debitage is coarse and dull lustre quartzite which was not selected for tool manufacture. This may indicate that the numerous large decortication flakes, secondary flakes, and core fragments may have functioned as expediency, throw away tools. Quartzite cobbles were readily available from the local glacial till, which might explain this preference for easily manufactured tools over the highly curated. This might also hold true for the siltstone, although the small number of siltstone tools to debitage should be a result of highly curated tools which do not appear proportionately in the archaeological record. Unfortunately, use wear on quartzite materials is extremely difficult to recognize and identify, and an analysis of that nature would far exceed the scope of this report. As in Component 1, the remainder of the chalcedony debitage is likely primarily the result of tool manufacture and resharpening.

5.2.2.3 LITHIC TYPES

Most of the lithic types identified in this component are represented in Component 1 and are described above.

QUARTZITES

Quartzites accounted for 72.5% (N=279) of the total assemblage. Within the quartzite category, 11% (N=31) were fine-grained, with tools comprising 19.4% (N=6) of these; 69.5% (N=194) were medium-grained (tools represented 2.0% (N=4) of these); and 19.4% (N=54) were coarse-grained (tools represented 11.1% (N=6) of these).

SILTSTONE

Siltstone accounted for 13.8% (N=53) of the assemblage of which 7.4% (N=4) were formed tools.

PEBBLE CHERTS

Local pebble cherts comprised 6.2% (N=24) of the assemblage of which only 8.3% (N=2) were formed tools.

SILICIOUS GREY AND BROWN BANDED CHERTS

These represent only 1.6% (N=6) of the lithic debitage and none of the formed tools. This banded chert may be Banff chert, which is regionally available (Lifeways of Canada Limited 1977:73). It is of good to excellent flaking quality. The small sample may indicate that it was highly curated.

SOUTH EVERSON CHERT

This material represents only 0.5% (N=2) of the lithic debitage and none of the formed tools.

AVON CHERT

The single example of this material is the projectile point fragment. Avon chert is a fine-grained, light brown sedimentary chert which usually patinates to a chalky white, as exhibited in this example. The source area is the Avon quarry, southwest of Helena, Montana (Reeves 1972: 278)

MONTANA CHERT

This material represents only 0.5% (N=2) of the lithic debitage and none of the formed tools. Probable source is the central Montana Rockies (Reeves 1972:279). These examples are brown-yellow in color and of excellent flaking quality.

PURCELLANITE

The single example of this material is a battered core. Purcellanite is a chert metamorphosized through association with burning coal seams (Reeves 1981: personal communication). The source of this particular example is unknown.

AGATE

Blocky, yellow agate comprises 2.9% (N=11) of the lithic assemblage. There are no formed tools of this material, which is extremely blocky and hence of poor flaking quality.

5.3.3 FAUNAL DESCRIPTION

5.3.3.1 SPECIES REPRESENTED

Apart from bison, one canid was represented by one first phalanx (size of Canis latrans). Two gophers, a natural occurrence (Spermophilus sp.) were also represented by three femori, three mandibles, one tibia, humerus, sternum, half an innominate and four vertebrae.

5.3.3.2 MINIMUM NUMBER OF INDIVIDUALS, AGE, SEX AND SEASONALITY

Only one bison was present. Two of the three mandibular premolars present were moderately worn but still cusped. The

other was more flattened. This would place the age of the bison at about 4.5 years (Reher 1974, p. 116). The one maxillary premolar was worn, but still cusped which would also indicate an age of 4.5 years (Wilson 1974, p. 157). Not enough data was available to indicate sex or seasonality.

5.3.3.3 BUTCHERING TECHNIQUE

The unidentifiable faunal remains from Component 3 were not extensive. Sixty-six fragments weighed 122.6 g of which five were burned (4.3 g) and three were calcined (2.9 g).

The cranium was only represented by ten tooth fragments weighing 31.9 g. Vertebrae elements consisted of fragments of the anterior articular process of the atlas vertebra and the posterior articular facets of an axis or cervical vertebra. The atlas fragments may have resulted from the removal of the skull from the rest of the body. The cervical fragments could have occurred when the vertebrae were segmented or the muscles stripped from around them.

The fore limb was only represented by one ulna fragment--the semi-lunar notch and articular facets (BU-2). The butchering of the posterior edge immediately behind the semi-lunar notch may have been done to facilitate the disarticulation of the radius and ulna from the humerus. The radius and ulna could then have been returned to the site with the attached muscles and have been further butchered for marrow extraction. This would explain the absence of recognizable radial fragments.

As in Component 2, the hind limb was well represented (100%). The left and right femora were both represented by a posterior shaft fragment with a portion of the supracondyloid fossa (BU-10). The left tibia was represented by a proximal/lateral shaft fragment (BU-34) and the right by the complete distal end

(BU-4) and a posterior shaft fragment containing the nutrient foramen (BU-5). The tarsals were represented by one right astragalus (BU-1) which articulated with the right distal tibia, a fragment of the left navicular cuboid (BU-14) and both left and right cuneiform pes (BU-1). One metatarsal was represented by a proximal/anterior shaft fragment (BU-4). One near second phalanx (BU-1) was also present.

The hind limb was probably returned in articulation to the site. The extremities were probably removed by butchering through the tarsals thus permitting the astragalus and distal tibia to be found together and with the fragmented navicular cuboid. All long bones were probably further reduced for marrow extraction resulting in the few recognizable fragments of femora, tibia and metatarsal. The low frequency of burned or calcined fragments (14%) would seem to suggest an absence of bone grease preparation activities and a non-use of bone as a fuel, as compared to Component 2 where 87% of the fragments were burned or calcined.

5.3.4 FEATURE DESCRIPTIONS (Figure 15)

No hearths, soil staining or other evidence of fire was directly observed. Indirect evidence includes five burned bone fragments and three calcined bone fragments with a combined weight of 7.2 g.

Approximately 75 fist to cobble sized unmodified quartzite cobbles were found to lie on the living floor. For the most part these are confined to the west half of the excavated floor. An alignment of these stones bisects the site from Test #21 on the north to Test #18 on the south. In the southwestern corner of the excavations, approximately 30 cobbles form a semi-circular arrangement with a calculated diameter of approximately 3 m. The open side of this feature faces north.

Lithic or faunal concentrations are not clearly expressed anywhere on the living floor. Although marked densities, as noted above, occur, generally the distribution of materials is relatively uniform.

5.3.5 FLOOR CHARACTERISTICS (Figures 15-17)

The analysis of spatial structure on the living floor is not here taken beyond the descriptive stage. The provenience data suggests only that the distributions are skewed. Faunal material is generally located on the south and west of the site. Artifactual concentrations, as noted below, are located in the south-central area of the site, Test #20 and along an area which trends southwest-northeast, from Test #16 to Test #13 (Figure 12).

The heaviest area of artifactual concentration occurs to the northwest of the stone features noted above. Faunal material is distributed in a similar manner as that of the lithics with the heaviest distributions occurring along the arc and as a compact distribution in the southeast corner of the excavations. The concordance of the three distributions--cobbles, faunal material and lithics--suggests strongly the existence of activity areas.

5.3.6 AGE

No radiocarbon dates are available from this floor. A radiocarbon age estimate for Component 2 on material from the second paleosol below the Mazama Ash in the West Basin provides an earliest date. The age of the Mazama horizon provides a latest date. The stratigraphic position of the paleosol immediately below the Mazama horizon provides an approximation of the age. No diagnostic material was recovered. A radiocarbon date for DjPo-49 which is characterized by a similar assemblage and exhibits components immediately above and below the ash

provides an analogy which suggests a similar date (Loveseth 1980). There the component was dated at 6340 +/- 160 B.P., the approximate age of the Mazama. Limiting dates are provided by a 7030 B.P. and a 6820 B.P. date for Component 2 and a 6600 year B.P. date for Mazama Ash.

5.3.7 CULTURAL AFFILIATION

While no diagnostic artifacts were associated with this component, its stratigraphic association below Mazama suggests that it may be affiliated with Early Mummy Cave which also occurs in a paleosol immediately above the ash layer. The Mummy Cave Complex refers to components characterized by distinctive side notched projectile points which occur along the eastern flank of the Rocky Mountains from Alberta to Wyoming (Buchner 1980:135). Other formed tools associated with the Mummy Cave Component include end scrapers, ovate bifaces, and hammerstones (Buchner 1980: 135). While these artifacts occur at EgPm-179, the paucity of formed tools makes it difficult to absolutely associate this component with other characteristic Mummy Cave Complex sites.

5.3.8 SUBSISTENCE

The distribution of faunal material is concordant with that of the stone feature and lithic distributions. Only bison was noted. No evidence for bone grease preparation was noted. Representation of the bison is more extensive than that of Component 2. The skull is represented by teeth only. The presence of teeth in archaeological sites without concomitant evidence of the use of the skull is presently not clearly understood; however, we are not of the opinion that the skull was removed to the site area (i.e., mandible or cranial elements). Given the high utility of limb elements, these were expected. Similar to that of Component 2, light butchering involving the removal of the hind limb to the activity area is supported. The

presence of a poor representation of the front limb is not easily explained, but is complemented by the presence of the upper vertebral elements (i.e., axias and cervical). One suspects that butchering was heavier in order to support a large group of people or a small number of hunters for a longer period of time. Evidence for a shelter tends to support this supposition. On the other hand, the absence of a hearth is perplexing given the interpretation that is forwarded. An occupation under milder conditions, whereby activities may have been located outside of the excavated area, could explain such an absence. Alternatively, vagaries of preservation or sampling could account for the absence of a greater representation of the front limb and axial elements if complete butchering was suspected.

5.3.9 SITE TYPE

The archaeological evidence suggests the presence of a hunting camp located near a kill of unknown proportions. Circumstantial evidence of more intensity or longer duration is present in the form of evidence for a shelter, concordant distributions of artifactual material and so forth. The absence of evidence for bone grease preparation suggests processing during a favorable season. Marrow extraction was no doubt practiced. A residential camp located elsewhere is possible. In most respects, the nature of the occupation, except for the duration or intensity of use, is similar to that encountered in Component 2 and different, for example, from that represented in the ring sites of the Nose Hill Uplands.

5.4 EARLY MUMMY CAVE/BITTERROOT--COMPONENT 4 (Plate 5)

The distribution of artifactual material attributed to the Early Mummy Cave/Bitterroot Component lying immediately above the Mazama Ash deposits was confined to the East Basin. Seven hundred and forty-eight artifacts were recovered. Of these 96.6%

(N=723) consisted of debitage specimens. Although somewhat deficient in numbers of formed tools, the overall number of artifacts is high. An unusually high number of decortication flakes, cores and core fragments suggests substantially more manufacturing activities during the duration of the occupation. The faunal assemblage includes two (minimum) bison and a single elk. Evidence of seasonality and age were lacking. The faunal assemblage was limited to a small number of cranial elements and limb elements.

5.4.1 STRATIGRAPHIC ASSOCIATIONS (Figures 5 and 6)

Component 4 was found to be associated with a paleosol immediately above the Mazama Ash between 60 and 100 cm below datum depending on the location of the unit within the basin.

5.4.2 LITHIC DESCRIPTIONS (Table 1)

5.4.2.1 FORMED TOOLS

PROJECTILE POINTS

SIDE NOTCHED ATLATL POINTS (N=2) (Plate 17, No's. 1 and 2)

Bitterroot Side Notched: No. 1

Form: Symmetrical ovate body form with straight to convex lateral edges. The tip and left lateral edge at the distal end are broken. Left shoulder is sharp, obtuse; right shoulder is sharp, obtuse. Both notches are broad and rounded. Left notch--basal edge juncture broken; right notch--basal edge juncture rounded acute. Left basal edge--broken right convex. Left basal edge--base juncture broken right rounded acute. Base is straight, symmetrical.

Modification: Bifacial, secondary pressure retouch, direction indeterminate. Base and notches thinned and ground.

Metrics:		
	Length	2.6 cm
	Width	1.8 cm
	Thickness	0.6 cm
	Weight	3.4 g

Lithic Type: Medium grained, lustrous pink quartzite.

Distribution: Test 12, Level 7, SE quadrant (Figure 19).

Discussion: Typical Bitterroot side notched point, generally associated with the Early Mummy Cave Complex ca. 6000-3500 B.C. (Reeves 1972).

Bitterroot Side Notched: No. 2

Form: Asymmetrical ovate body form with convex lateral edges. Tip is broken. Left shoulder, sharp acute; right shoulder, rounded obtuse. Left notch--rounded obtuse, right notch--broad V shaped. Notch basal edge junctures rounded, obtuse. Left basal edge, straight parallel; right basal edge straight expanding toward base. Basal edge--base juncture sharp acute. The base is straight symmetrical.

Modification: Complete, bifacial diagonal pressure retouched, flake scars ca. 2 mm in width. Notches and base thinned unground.

Metrics:		
	Length	2.2 cm
	Width	1.7 cm
	Thickness	0.5 cm
	Weight	2.2 g

Lithic Type: Green pebble chert with calcareous inclusions.

Distribution: Test 13, Level 7, NW quadrant (Figure 18).

Discussion: Typical Bitterroot side notched point, generally associated with the Early Mummy Cave Complex ca. 6000 - 3500 B.C. (Reeves 1972).

BIFACES (N=2)

ASYMMETRICAL LANCEOLATE (N=1) (Plate 17, No. 3)

Form and Modification: Body form asymmetrical lanceolate, with a left distal skew and sharp tip. Piece modified by bifacial hard hammer percussion retouch. Base straight, thinned and ground possibly for hafting.

Metrics:		
	Length	3.3 cm
	Width	1.8 cm
	Thickness	0.5 cm
	Weight	3.6 g

Lithic Type: Fine-grained, lustrous red quartzite.

Distribution: Test 6, Level 4, east half (Figure 19).

SYMMETRICAL OVATE (N=1) (Plate 17, No. 4)

Form and Modification: Body form symmetrical ovate, with a slight right distal skew. Sharp tip was broken and biface body subsequently resharpened. Tip--triangular with slight left distal skew. Some cortex remaining on dorsal surface. Body modification--complete bifacial, pressure retouch. Some remaining cortex on dorsal surface.

Metrics:	Body	Tip
Length	3.7 cm	1.5 cm
Width	2.8 cm	1.9 cm
Thickness	1.0 cm	0.4 cm
Weight	11.5 g	1.0 g

Lithic Type: Fine-grained, lustrous grey quartzite.

Distribution: Test 18, Level 7, SW quadrant (body); Test 13, Level 5, SE quadrant (tip) (Figure 19).

SCRAPERS (N=1)

END SCRAPER (N=1) (Plate 17, No. 5)

Form and Modification: Quartzite core modified by steep (60-70 degrees) unifacial retouch on both lateral edges and distal end and dorsal surface. Ventral surface unmodified. Some cortex remains on proximal end and along longitudinal ridge.

Metrics:	
Length	5.5 cm
Width	4.0 cm
Thickness	1.8 cm
Weight	43.5 g

Lithic Type: Fine-grained, lustrous grey quartzite.

Distribution: Test 12, Level 6, NW quadrant (Figure 19).

WEDGES (N=3)

BIPOLAR CORE WEDGE (N=1)

Form and Modification: Ovoid bipolar split core modified by pressure retouch on both lateral edges and distal end. Use wear

crushing on both lateral edges.

Metrics:	Length	4.3 cm
	Width	3.7 cm
	Thickness	1.2 cm
	Weight	12.3 g

Lithic Type: Grey-brown chalcedony.

Distribution: Test 15, Level 8, SW quadrant (Figure 18).

FLAKE WEDGE (N=2)

Form and Modification: Both examples are secondary flakes modified by bifacial retouch on one lateral edge. Both exhibit use wear crushing on the worked edge.

Metrics:	Length	3.7 cm	3.9 cm
	Width	2.4 cm	1.7 cm
	Thickness	1.1 cm	1.1 cm
	Weight	9.1 g	9.1 g

Lithic Type: Fine, lustrous grey quartzite; fine, lustrous rose quartzite.

Distribution: Test 19, Level 5, SW quadrant; Test 12, Level 7, SW quadrant (Figure 19).

SPALL TOOLS (N=7)

RETOUCHED (N=5)

Form and Modification: All examples are large decortication flakes modified by bifacial retouch on one lateral edge (N=1) and unifacial retouch on both lateral edges (N=4). All examples

exhibit considerable use wear crushing on at least one lateral edge. One example exhibits flake removal near proximal end, possibly hafting modification. All exhibit hard hammer percussion retouch.

Metrics:		
	Length	5.3 - 8.9 cm
	Width	3.3 - 6.6 cm
	Thickness	1.3 - 3.3 cm
	Weight	29.6 - 212.2 g

Lithic Type: Fine, lustrous quartzite (N=2); fine, dull quartzite (N=1); coarse, dull quartzite (N=2).

Distribution: Test 11, Level 6, NE quadrant; Test 9, Level 5, SW quadrant; Test 11, Level 7, NW quadrant; Test 14, Level 6, SW quadrant; Test 18, Level 7, NE quadrant (Figure 19).

UTILIZED (N=2)

Form and Modification: Both examples are large decortication flakes modifed by bifacial use wear crushing at the distal end.

Metrics:			
	Length	14.6 cm	8.8 cm
	Width	11.3 cm	7.1 cm
	Thickness	3.7 cm	2.3 cm
	Weight	649.8 g	160.0 g

Lithic Type: Coarse-grained, dull, grey quartzite; fine-grained, lustrous, grey quartzite.

Distribution: Test 9, Level 5, NW quadrant; Test 19, Level 6, NW quadrant (Figure 19).

RETOUCHED FLAKES (N=9)

LOCALIZED (N=4)

Form and Modification: All examples are marginally retouched, secondary flakes, either unifacial, one lateral edge (N=1); bifacial, one lateral edge (N=2); or unifacial, both lateral edges (N=1). All exhibit some evidence of use wear. Platform crushing (N=1) may be evidence of platform preparation.

Metrics:				
Length	3.3 cm	3.6 cm	2.5 cm	4.0 cm
Width	3.85 cm	2.1 cm	1.6 cm	2.9 cm
Thickness	0.81 cm	0.6 cm	0.7 cm	1.0 cm
Weight	17.1 g	4.8 g	3.2 g	11.9 g

Lithic Type: Medium, lustrous grey quartzite (N=1); grey pebble chert (N=2); grey banded siltstone (N=1).

Distribution: Test 19, Level 6, SE quadrant; Test 18, Level 8, NE quadrant; Test 14, Level 6, NW quadrant; Test 6, Level 4, east half (Figures 18 and 19).

PATTERNED (N=5)

Form and Modification: All examples are secondary flakes modified by either unifacial retouch along both lateral edges, dorsal surface (N=4), or unifacial retouch, distal end, dorsal surface (N=1). Three examples exhibit use wear crushing, one possible hafting modification.

Metrics:					
Length	4.8 cm	2.5 cm	2.4 cm	3.1 cm	4.2 cm
Width	2.7 cm	1.5 cm	2.2 cm	1.9 cm	4.3 cm
Thickness	0.5 cm	0.5 cm	0.8 cm	1.6 cm	1.5 cm
Weight	8.5 g	2.3 g	4.4 g	3.3 g	35.5 g

Lithic Type: Fine, lustrous white quartzite; fine, lustrous yellow quartzite; fine, lustrous grey quartzite; green pebble chert; fine, lustrous brown quartzite (Figures 18 and 19).

5.4.2.2 LITHIC TECHNOLOGY (Table 6)

TOOLS

Percentages of formed tool types and materials used for these types correspond closely to those exhibited in Component 3, suggesting that these occupations were cultural and chronologically related, separated only by the Mazama Ash layer, which apparently only temporarily disrupted the Hawkwood occupation. The tool assemblage is represented by small frequencies of points (N=2), bifaces (N=3) and a scraper (N=1) in numbers similar to Component 3 (N=1, 3 and 1 respectively). In both components, unifacially worked spall tools and retouched flakes were the most representative tools (N=7 and 7; 6 and 9 respectively in the two components). Core choppers were not common in either component (N=3 and 0 respectively). Wedges, probably used for splitting wood or bone for tool manufacture or marrow extraction appear in Component 4 (N=3) but are absent in Component 3. The tools represented in both assemblages suggest that both occupations were campsites in which a variety of activities took place, most notably hide working and secondary butchering (bifaces, scrapers, spall tools and retouched flakes). The absence of large stone choppers may indicate that primary killing and butchering of animals took place elsewhere. As in the other components, the tool assemblage represents only a small percentage (3.3%, N=25) of the total lithic assemblage.

As in Component 3, the selection of lithic material for the formed tools was restricted almost entirely to locally available quartzites (76%, N=19). Local pebble cherts comprised only 20% (N=5) of the tool assemblage, and chalcedony only 4% (N=1).

Also, as in the other components, there was an obvious selection for fine- to medium-grained lustrous quartzites which exhibit a higher flaking quality. Cryptocrystallines may not have been exploited due to the paucity of locally available source materials.

DEBITAGE

Lithic debitage comprised 96.7% (N=723) of the total assemblage. As in Component 3 the majority of this (77.0%, N=557) was local quartzite. Probably much of the medium- to coarse-grained, dull, lustre quartzite which was unsuitable for formed tool manufacture may have been used for expediency tools. This is suggested by the large proportion of unretouched secondary flakes in the assemblage (32.9%, N=183).

The presence of cores, core fragments and decortication flakes (2.2%, N=16; 2.2%, N=16; 8.8%, N=64) suggests that primary core reduction was taking place at the site. Tool manufacture and sharpening also occurred, as indicated by the large percentage of thinning and retouch flakes (49.6%, N=354). Of this, a great proportion was fine- to medium-grained quartzite (70.6%, N=250), the preferred material of the formed tools.

Overall, there is a dramatic increase in the size of the lithic assemblage as compared to Components 1 and 3 (N=472, N=385, and N=748 respectively). This may indicate either a longer occupation for the component or greater population density.

5.4.2.3 LITHIC TYPES (Table 6)

As mentioned above, the majority of the lithic assemblage consists of locally available materials, notably quartzite.

QUARTZITE

Quartzite comprised 74.4% (N=557) of the total assemblage. Of this, 35.7% (N=199) was fine-grained, 55.8% (N=311) was medium-grained and 8.4% (N=47) was coarse-grained. All quartzites were available from local glacial till cobbles.

BEAVER CREEK QUARTZITE

A single example appears to be Beaver Creek quartzite (a core fragment). Beaver Creek quartzite is extremely rare in the Calgary area and can be obtained from sources in Northeastern Alberta (Ronaghan 1981).

QUARTZ CRYSTAL

A single example of quartz crystal was identified in the assemblage. It was probably locally obtained.

SANDSTONE

Two sandstone flakes were obtained. They were of extremely poor flaking quality and may be non-cultural. The source is unknown, but probably local.

SILTSTONE

Local siltstone comprised 11.1% (N=83) of the assemblage, of this only 9.0% (N=1) represented formed tools. The majority of the debitage (56.1%, N=46) was retouch and thinning flakes.

PEBBLE CHERTS

Local pebble cherts comprised 11.8% (N=88) of the assemblage, and of this only 5.7% (N=5) represented formed tools. Thinning and

retouch flakes comprised 44.3% (N=34) of the debitage, suggesting that primary core reduction may have occurred elsewhere.

IMPORTED CHERTS

ETHERINGTON CHERT

Only two examples of this material were identified in the collection. These were translucent, siliceous, amber examples of good flaking quality. It is obtained from one of several quarry sources in the Livingston Range in the Rocky Mountains (Loveseth 1980: 157).

AVON CHERT

Avon chert comprised 1.5% (N=11) of the total collection. All examples were flake debitage. Source is Avon, Montana (Loveseth 1980: 161).

CHALCEDONY

Only two examples of chalcedony were identified, one of which was a formed tool. The source is unknown but probably local.

IGNIMBRITE

Only one ignimbrite flake was found in this component. Ignimbrite is similar to obsidian, but semi-translucent to opaque rather than translucent. The source is unknown, but possibly as far removed as obsidian cliff in Yellowstone National Park (Loveseth 1980: 166).

5.4.3 FAUNAL DESCRIPTION

5.4.3.1 Species Represented

Apart from bison, one elk (Cervus) was represented by one left first phalanx.

5.4.3.2 Minimum Number of Individuals, Age, Sex and Seasonality

Two bison were represented in Component 4. The fused tuber calcis on the calcaneum in the faunal material indicated one bison was older than 4 years. Two maxilla molars were present. One exhibited slightly worn cusps but the lingual style was still unworn below the level of the cusps. The other molar showed no wear at all and was probably in the process of erupting or was as yet unerupted. If this latter molar was a M3, the last to erupt, the bison was probably less than 2.5 years old (Wilson 1974:156).

Not enough data was available for sexing or seasonality.

5.4.3.3 Butchering Technique

Slightly more material was found in Component 4 than in Component 3. Eighty-five unidentifiable fragments weighed 289.9 g of which two were burned (1.5 g) and four were calcined (4.5 g).

The cranium was only represented by two maxilla molars and 18 tooth fragments (73.9 g). No identifiable vertebrae or rib fragments were present, indicating "light" butchering.

The fore limb was represented by the distal condyles of a left humerus (BU-2) and a lateral shaft fragment of a humerus--characterized by the muscular spiral groove below the deltoid tuberosity (BU-16). A proximal end fragment of a right

metacarpal (BU-3) was also present. The fore limb could have been segmented by chopping through the distal shaft of the humerus freeing the distal condyles and the meat, then stripped from the shoulder area and returned to the site with the distal elements. The humeral shaft could have been further reduced for marrow extraction. No recognizable radial or ulnar fragments were present but these elements could have been reduced for marrow extraction. The metacarpals may also have been reduced.

The hind limb was represented by a distal posterior/medial shaft fragment of a right tibia (BU-16), two fragments of one right astragalus (BU-8, 9), two fragments of one right calcaneum (BU-5, 15) and a fragment of a left cuneiform pes (BU-2). The hind limb also seems to have been brought to the site in articulation, though lack of femural fragments could indicate meat stripping from these elements elsewhere. The femora and tibiae could also have been reduced for marrow extraction. The butchered astragalus and calcaneum would indicate segmentation occurred through tarsals. The proximal lateral articular surface of the astragalus (BU-8) may have been removed with the lateral articular surface of the calcaneum in the removal of the extremeties. The tuber calcis and shaft fragment of the calcaneum (BU-5) could have been butchered to aid in stripping the gastric muscles.

The low frequency of burned or calcined material (7%) is similar to Component 3 and possibly indicates bone grease was not produced in this component, nor were bones used as fuel.

The greatest amount (N=193) of faunal material in Component 4 was in the southwest quadrant of Test 15, but almost as much (17%) was found in the northeast quadrant of Test 17. The majority of other bone fragments (44%) were scattered near this area while most of the tooth fragments were found to the northeast.

5.4.4 FEATURE DESCRIPTIONS

The floor of Component 4 in the East Basin did not evidence clear or distinctive features. Cobble sized rocks appeared to lie randomly about the excavated portion of the floor area. On the other hand, the high number of debitage specimens almost guaranteed that densities would be high and that at least some concentrations would appear. Characteristically, the concentrations, perhaps representing knapping locations, were not found to be associated with faunal material.

5.4.5 FLOOR CHARACTERISTICS (Figures 18 and 19)

The analysis of spatial structure on the living floor is not here taken beyond the descriptive stage. The provenience data suggests the presence of concentrations of lithic and faunal materials; however, such concentrations are generally not correlated with each other, with cobbles, or with formed tools. Lithic concentrations exist in Tests 8, 13, 18 and 21 while faunal concentrations appear in Tests 15 and 17.

Quartzite tools and debitage (Figure 19) are quite densely distributed throughout the site, although there are some areas of especially dense lithic clusters which may represent specific knapping locations. These include Tests 8, 13, 18 and 21. There are no features evident. Quartzite formed tools are quite evenly distributed throughout the site although there is some evidence for clustering of spall tools in the south-central area of the site (see Figure 19).

Cryptocrystalline tools and debitage (Figure 18) are generally sparse throughout the site and exhibited no obvious activity patterning. There is some clustering which may be a reflection of knapping activities in the NW quadrant of Test 21 (see Figure 18) and the south half of Test 14.

5.4.6 AGE

No radiocarbon dates were obtained on this poorly defined but strongly expressed component. The Bitterroot affiliation of the component and its stratigraphic position within the profile immediately above the Mazama Ash provides a basic chronological framework with which to work. The Mazama Ash deposit (ca. 6600 B.P.) provides an oldest date, while the duration of Bitterroot provides a basic comparative date, and dates on Oxbow/Late Mummy Cave provide a latest date. With this in mind, Component 4 must have been deposited during the period between 6600 B.P. and 4500 B.P. An apparent continuity between the assemblage below the ash (Component 3) and the component above the ash suggests an occupation during the earlier quartile of this span.

5.4.7 CULTURAL AFFILIATION

As suggested in the discussion of Component 3, it seems probable that both Components 3 and 4 were chronologically and culturally associated, both being manifestations of the Early Mummy Cave Complex, separated only by the Mazama Ash layer which may have caused a disruption in the use of this area. For a full discussion of this period see the discussion of Component 3 (Section 5.3).

Comparable excavated components of this period in or adjacent to the plains include: Gap Site (PhPo-9) in the Rocky Mountains or southwestern Alberta where similar components exist above and below Mazama Ash; sites in Waterton Park and the Swan River site (Gryba 1968) in Manitoba (Reeves 1972:32). The distinctive side notched points of this period are regarded as being intrusive from the Eastern Plains--Woodlands cultures which displaced the indigenous Plains-Mountains populations (ibid) (Reeves 1979).

The diagnostic Bitterroot projectile points identified in the Hawkwood occupation are generally regarded as representative of an aspect of the Mummy Cave Complex types (Buchner 1980; 144). As at Hawkwood, Bitterroot components tend to overlie Mazama (ibid: 147). The nearest comparable sites probably of this period (to Hawkwood) would include those identified in the Waterton Park area and classified by Reeves (Reeves 1972: 102) as representing the Bellevue Hill Subphase. This subphase is characterized by Bitterroot side notched points, ovate bifaces, microcrystalline end scrapers, wedges, retouched flakes and decortication flake tools, all of which appear at Hawkwood. Other comparisons would include the early Mapleleaf Subphase ca. 5500 B.P. in the Crowsnest Pass (Loveseth 1980: 42) in which Bitterroot points in association with variant styles of side notched projectile points occur.

Despite the distinctive tool kit and large number of flakes identified at Hawkwood, the site probably served, like the earliest component, as a meat camp where lithic manufacture and secondary butchering and meat processing occurred.

5.4.8 SUBSISTENCE

The distribution of faunal material is limited to a number of concentrations in the north and northeast areas of the excavation. Elk and bison are represented in the faunal assemblage. A minimum of two bison are represented. An older bison (G.T. 4 years) and one that was less than 2.5 years are present. The bison were represented by a left fore limb and a right rear limb. Corresponding elements of right fore limb and left rear limb were present as a marginal fraction. The general faunal assemblage represents what has been referred to as light butchering. Burned and calcined bone was found in very small numbers (approximately 7%).

5.4.9 SITE TYPE

The archaeological evidence suggests the presence of a transitory use area lacking definable activity areas other than lithic scatters. The high density of lithic debitage at once suggests manufacturing activities in a higher proportion than other components at the site. While the location of the site argues against a primary quarry/manufacturing site, the faunal component argues for a similarity to other components. The absence of structure suggests either degradation of the site prior to burial or a focus of activities elsewhere.

5.5 LATE MUMMY CAVE/OXBOW--COMPONENT 5 (Plates 4, 5, 8, 9 and 10)

The Late Mummy Cave/Oxbow occupation was identified in both the East and West Basins. The East Basin assemblage is attributed to the Oxbow Phase on the basis of three diagnostic projectile points. The West Basin, in addition to Oxbow, contained a Hanna Side Notched point. While the East Basin contained eight unifaces and no bifaces, the West Basin contained a biface and three biface fragments and only one uniface. The East Basin consisted of an assemblage numbering 901 specimens with 40 (4.4%) falling into formed tool classes. In the West Basin, the assemblage consisted of 1061 artifacts of which 65 (6.1%) were formed tools.

In the West Basin the presence of a substantial number of cobbles is indicative of the existence of activity areas. Similarly, the presence of a hearth, concentrations of fire broken rock, and a non random distribution of artifactual material also argues for the presence of features. In contrast the East Basin contains a substantially smaller number of cobbles and less definitive activity areas. On the north side of the excavation a small accurate alignment of stone and a hearth are present. In addition a lithic concentration is present on the east and south

side of the excavation.

A minimum of three bison are represented, two in the East Basin and one in the West Basin. The former are approximately 3.5 and between 4.5 and 6 years of age while the latter is approximately 2.5 years of age. In addition, one fox and one moose(?) were recognized in the collection from the East Basin. All of the identifiable bison elements were either cranial (teeth) and/or associated with the left hind limb.

5.5.1 STRATIGRAPHIC ASSOCIATION (Figures 5-8)

In the East Basin, Component 5 is associated with B/C horizon sediments but between 24 and 50 cm b.s., again depending on the location of the excavated unit within the basin. Given the absence of evidence for Component 4 in the West Basin, the cultural deposits are again clearly segregated from those above and below (Figures 5 and 6).

In the West Basin, Component 5 is associated with B/C horizon sediments between 32 and 64 cm b.s. depending on the location of the unit within the basin. In all locations the component is clearly segregated from Component 2 which lies below (Figures 7 and 8).

5.5.2 LITHIC DESCRIPTION

5.5.2.1 FORMED TOOLS

PROJECTILE POINTS (Plate 18:2)

OXBOW SIDE NOTCHED (N=3)

Form: Ovate--triangular in outline with convex straight lateral

edges. Shoulder--notch junctures are sharp obtuse (N=2) or sharp acute (N=1). Notches are shallow and rounded. Notch--basal edge junctures are sharp obtuse. Basal edges are straight contracting. Basal edge--base juncture sharp obtuse. Bases deep concave.

Modification: All examples are modified by bifacial, irregular, diagonal pressure flaking. The bases are bifacially thinned and ground.

Metrics:		
	Length	2.0 - 2.4 cm
	Width	1.7 - 2.1 cm
	Thickness	0.5 cm
	Weight	1.8 - 2.3 g

Lithic Type: Black pebble chert (N=2); white, medium-grained, lustrous quartzite (N=1).

Distribution: Test 20, Level 5, NW quadrant; Test 8, Level 3, SE quadrant; Test 11, Level 4, SE quadrant (Figures 21 and 22).

BIFACES (N=2)

Form and Modification: The examples are asymmetrical triangular (N=1) and symmetrical ovate (N=1) in body form. Both have sharp tips and unmodified platform proximal ends. Both are modified by complete bifacial retouch.

Metrics:		
	Length	3.7 - 9.0 cm
	Width	2.4 - 5.0 cm
	Thickness	0.7 - 1.3 cm
	Weight	5.9 - 73.0 g

Lithic Type: Grey pebble chert; medium, lustrous green quartzite.

Distribution: Test 9, Level 3, SW quadrant; Test 5, Level 3, SW quadrant (Figures 21 and 22).

BIFACE FRAGMENTS (N=3) (Plate 18:3)

Form and Modification: All examples are asymmetrical ovate in form with one lateral edge straight and the other exhibiting a medial skew. All are modified by bifacial hard hammer percussion retouch.

Metrics:	Length	3.2 cm	4.7 cm	5.8 cm
	Width	2.3 cm	2.8 cm	4.3 cm
	Thickness	0.8 cm	1.3 cm	1.3 cm
	Weight	6.4 g	18.9 g	40.5 g

Lithic Type: Grey banded siltstone; fine, lustrous grey quartzite; fine, lustrous red quartzite.

Distribution: Test 8, Level 3, NE quadrant; Test 9, Level 3, NW quadrant; Test 4 (Figures 21 and 22).

SCRAPERS

SPLIT PEBBLE (N=1)

Form and Modification: Discoid split pebble modified by steep unifacial retouch on both lateral edges and distal end, dorsal surface.

Metrics:	Length	3.7 cm
	Width	2.6 cm
	Thickness	1.1 cm
	Weight	10.8 g

Lithic Type: Coarse, dull grey quartzite.

Distribution: Test 4 (Figure 22).

SPALL TOOLS

RETOUCHED (N=5)

Form and Modification: All examples are large decortication flakes modified by unifacial retouch on the ventral surface both lateral edges, distal and proximal ends (N=3); distal end (N=1) and distal end dorsal surface (N=1). All exhibit use wear crushing on at least one lateral edge.

Metrics:	Length	5.7 cm	3.6 cm	12.8 cm	11.2 cm
	Width	4.4 cm	2.4 cm	13.0 cm	10.3 cm
	Thickness	2.5 cm	0.7 cm	3.5 cm	3.7 cm
	Weight	68.2 g	8.6 g	797.4 g	386.9 g

Lithic Type: Fine, lustrous grey quartzite (N=2); fine, lustrous yellow quartzite (N=1); medium, lustrous yellow quartzite (N=1); coarse, lustrous red quartzite (N=1).

Distribution: Test 21, Level 5, NW quadrant; Test 13, Level 5, SE quadrant; Test 19, Level 3, SW quadrant; Test 5, Level 5, SE quadrant; Test 21, Level 4, SW quadrant (Figure 22).

COBBLE CORE CHOPPERS

BIFACIAL (N=1)

Form and Modification: Cobble core modified by bifacial retouch, dorsal surface, distal end and entire ventral surface to create a sharp cutting edge at the distal end of the piece.

Metrics:	Length	14.2 cm
	Width	9.7 cm
	Thickness	6.1 cm
	Weight	664.7 g

Lithic Type: Medium, lustrous grey quartzite.

Distribution: Test 13, Level 4, SW quadrant (Figure 22).

UNIFACIAL (N=3)

Form and Modification: All are cobble cores modified by unifacial retouch on one lateral edge to create a sharp cutting edge. Use wear is evident on two examples.

Metrics:	Length	14.1 cm	9.2 cm	8.4 cm
	Width	13.1 cm	5.4 cm	6.5 cm
	Thickness	8.6 cm	3.5 cm	3.6 cm
	Weight	1061.6 g	174.1 g	168.7 g

Lithic Type: Medium, lustrous grey quartzite (N=2); medium, dull red quartzite (N=1).

Distribution: Test 21, Level 5, SW quadrant; Test 9, Level 4, SW quadrant; Test 20, Level 5, NE quadrant (Figure 22).

RETOUCHED FLAKES

LOCALIZED (N=10)

Form and Modification: All examples are secondary flakes modified by unifacial retouch on one lateral edge (N=2); distal end (N=4) or one lateral edge and distal end (N=1) or by bifacial retouch or distal and single lateral edge (N=1); single lateral edge (N=2) or both lateral edges (N=1). Five examples exhibit

some evidence of use wear.

Metrics:		
	Length	2.5 - 9.7 cm
	Width	1.8 - 7.2 cm
	Thickness	0.6 - 2.7 cm
	Weight	3.2 - 160.7 g

Lithic Types: Fine, lustrous grey quartzite (N=2); medium, lustrous grey quartzite (N=2); fine, lustrous purple quartzite (N=1); medium, lustrous green quartzite (N=1); coarse, dull red quartzite (N=1); grey siltstone (N=3).

Distribution: Test 11, Level 4, NW quadrant; Test 8, Level 4, SW quadrant; Test 7, Level 3, west half; Test 7, Level 3, west half; Test 21, Level 3, NW quadrant; Test 5, Level 5, NE quadrant; Test 21, Level 3, NW quadrant; Test 12, Level 4, SE quadrant; Test 18, Level 6, NW quadrant; Test 15, Level 5, SW quadrant (Figure 21 and 22).

PATTERNED (N=7)

Form and Modification: These examples exhibit patterned retouch; either unifacial, on one lateral edge (N=3) or both lateral edges and proximal end (N=1) or bifacial, on both lateral edges (N=3).

Metrics:		
	Length	1.3 - 5.0 cm
	Width	1.1 - 5.3 cm
	Thickness	0.3 - 1.7 cm
	Weight	0.7 - 53.8 g

<u>WEDGES</u> (N=1) (Plate 18:4)

Form and Modification: These tools are either bipolar cores (N=3) or secondary flakes (N=1). All exhibit bifacial retouch and use wear crushing at both proximal and distal margins. One

example was possibly a composite tool exhibiting bifacial retouch on proximal end (wedge) and steep, unifacial retouch at distal end (scraper?) (Plate 18:4). Both lateral edges were also bifacial retouched.

Metrics:	Length	3.3 cm	1.6 cm	3.5 cm	2.3 cm
	Width	1.2 cm	1.6 cm	2.5 cm	1.5 cm
	Thickness	0.7 cm	0.5 cm	0.8 cm	0.7 cm
	Weight	3.5 g	1.5 g	6.7 g	2.6 g

Lithic Type: Green pebble chert; translucent chalcedony; brown chalcedony; grey pebble chert.

Distribution: Test 8, Level 3, NW quadrant; Test 10, Level 6, SE quadrant; Test 19, Level 3, SW quadrant; Test 19, Level 4, NE quadrant (Figure 21).

5.5.2.2 LITHIC TECHNOLOGY (Table 2)

TOOLS

Formed tools represent only 4.4% (N=40) of the lithic assemblage. As in the other components the majority are made from local quartzites 62.5% (N=25), siltstone 10% (N=4) and pebble chert 15% (N=6). As in Components 3 and 4, there is no apparent dichotomy between material selected for small formed tools as apparent to large chopping and scraping tools. Almost all formed tools of quartzite are manufactured from lustrous fine to medium-grained materials which were of superior flaking quality.

DEBITAGE

The debitage represented in this collection indicates that all forms of tool manufacture were undertaken at the site during this occupation, from core reduction to tool thinning, retouching and

resharpening. Cores and core fragments represent 4.9% (N=42) of the lithic debitage; decortication flakes represent 17.1% (N=147); secondary flakes represent 24.5% (N=211); thinning, retouch and resharpening flakes 39.9% (N=344); and shatter and nonidentifiable flakes 13.7% (N=118). The overall debitage percentages are generally consistent with the other components at the site.

The majority of the retouch and thinning debitage (68.6%, N=229) was fine to medium grained quartzite, the preferred formed tool materials, and was probably the result of tool manufacture. Unretouched secondary flakes which represent almost 25% of the debitage may have been used for expediency tools, especially the larger medium to coarse grained examples.

Overall, there appears to be a steady increase in the size of the lithic assemblage as compared to the earlier components (N=472:385:748:902 respectively). This may indicate either a longer occupation of the component or greater population density.

5.5.2.3 LITHIC TYPES (Table 7)

QUARTZITE

Quartzite represents 78.3% (N=706) of the total lithic assemblage. Of this, 3.54% (N=25) are formed tools. Fine-grained quartzite represents 23.8% (N=168) of the quartzite assemblage; 50.1% (N=354) are medium-grained and 26.1% (N=184) are coarse-grained.

SANDSTONE

Only one example of this material was identified in the assemblage. The source is unknown, probably local.

SILTSTONE

Local siltstone represents 10.8% (N=97) of the total assemblage. Of this, 4.1% (N=4) consisted of formed tools. A large proportion of the siltstone is unworked secondary flakes (24.2%, N=24) which may have been utilized as expediency tools, although use wear is not immediately evident.

PEBBLE CHERTS

Local pebble cherts represent 9.9% (N=89) of the total assemblage. Of this, 6.7% (N=6) consisted of formed tools. A large proportion of the debitage consisted of thinning and retouch flakes (46.1%, N=41) suggesting that a good deal of the debitage was the result of tool manufacture and that unworked chert secondary flakes were generally utilized.

RED, HEAT TREATED CHERT

Only three examples, all debitage of this material, were identified in the assemblage. The source is unknown, probably local.

SWAN RIVER CHERT

Only one example of this material, a retouched flake, was identified in the assemblage. This chert is coarse-grained and pink to cream white in color and is of medium flaking quality. The source may be the Swan River Valley, Manitoba or from local cobbles deposited during Laurentide glaciation (Loveseth 1980: 164).

CHALCEDONY

Only two examples of this material were identified in the assemblage. Both were formed tools. Chalcedonies are locally available, and the particular source of these examples is unknown.

PETRIFIED WOOD

Only three examples of this material were identified in the assemblage. All were flake debitage. The material was probably locally available but not generally exploited due to its poor flaking quality which results in irregular, blocky flakes.

5.5.3 LITHIC DESCRIPTION - WEST BASIN (Table 2)

5.5.3.1 FORMED TOOLS

PROJECTILE POINTS:

OXBOW SIDE NOTCHED (N=4) (Plate 19:3, 4 and 5)

Form: All examples are ovate-triangular in body outline. All tips are broken, shoulder--notch junctures are sharp acute, notches shallow, rounded (N=3) or deep rounded (N=1). Basal edges are straight, contracting towards the base. Bases range from shallow convex (N=2) to deep convex (N=2).

Modification: All examples exhibit complete bifacial, irregular diagonal pressure flaking. Bases and notches are thinned and ground.

Metrics:		
	Length	2.0 - 3.3 cm
	Width	1.4 - 2.2 cm
	Thickness	0.5 cm

Weight 1.3 - 4.1 g

Lithic Type: Grey pebble chert (N=1); green pebble chert (N=3).

Distribution: 3N18W (N=1); 6N10W S1/2 (N=1); 2N16W (N=2) (Figure 24).

HANNA SIDE NOTCHED (N=1) (Plate 19:2)

Form: Ovate-triangular in outline with slightly convex sides contracting to tip which is broken. Shoulder-notch juncture sharp acute. Notches, deep, rounded. Basal edge straight, contracting to base. Basal edges narrower than body, giving the base a "fish-tailed" appearance. Base, shallow, convex.

Modification: Bifacial, soft hammer percussion retouch confined to lateral, proximal and distal margins. Medial portions retain either unmodified cortex on the dorsal surface or original, unmodified flake surface on the ventral. Base and notches are thinned and ground.

Metrics:		
	Length	3.6 cm
	Width	2.1 cm
	Thickness	0.5 cm
	Weight	4.9 g

Lithic Type: Black pebble chert.

Distribution: Tip 5N2W (SW quadrant); base 5N1W (S1/2) (Figure 24).

SCRAPERS

END SCRAPERS (N=2)

Form and Modification: Both examples are large, decortication flakes, ovoid (N=1) or lunate (N=1) in shape. Both are modified by steep, unifacial hard hammer percussion and secondary soft hammer retouch on the dorsal surface distal end.

Metrics:	Length	5.7 cm	8.4 cm
	Width	5.3 cm	6.4 cm
	Thickness	3.0 cm	2.6 cm
	Weight	127.5 g	180.8 g

Lithic Type: Medium, lustrous green quartzite; fine, lustrous pink quartzite.

Distribution: 3N2W (N=2) (Figure 25).

SIDE SCRAPER (N=1)

Form and Modification: Large secondary flake, broken and irregular in shape, modified by steep, soft hammer percussion retouch on the left lateral edge.

Metrics:	Length	5.7 cm
	Width	3.2 cm
	Thickness	1.4 cm
	Weight	24.6 g

Lithic Type: Petrified wood.

Distribution: 0N4W (Figure 24).

SPLIT PEBBLE SCRAPERS (N=5) (Plate 19:6-9)

Form and Modification: All examples are split pebbles, ovoid (N=4) to triangular (N=1) in shape. All are modified by steep, unifacial pressure retouch along the distal margin. All retain

unmodified cortex on the dorsal surface with a single exception, from which the entire dorsal cortical surface has been removed with regular pressure retouch.

Metrics:	Length	1.9 - 2.5 cm
	Width	1.4 - 2.5 cm
	Thickness	0.3 - 1.8 cm
	Weight	1.2 - 7.9 g

Lithic Type: Siltstone (N=1); black pebble chert (N=2); grey pebble chert (N=1); green pebble chert (N=1).

Distribution: 5N4W (N=1); 3N4W (N=1); Test 3 (Figure 24).

RETOUCHED (N=2)

Form and Modification: Both examples are ovoid decortication spalls modified by localized retouch on one lateral edge, ventral surface (N=1) or localized retouch on one lateral edge dorsal surface. Both exhibit use wear crushing on retouched margins.

Metrics:	Length	10.6 cm	10.1 cm
	Width	7.3 cm	6.1 cm
	Thickness	1.8 cm	2.7 cm
	Weight	178.6 g	158.8 g

Lithic Type: Medium, lustrous yellow quartzite; medium, lustrous white quartzite.

Distribution: (Tables 1 and 8; Figures 24 and 25)

UTILIZED (N=2)

Form and Modification: Ovoid decortication spall modified by use wear crushing along distal margin.

Metrics:		
	Length	5.5 cm
	Width	5.5 cm
	Thickness	1.3 cm
	Weight	44.9 g

Lithic Type: Fine, lustrous grey quartzite.

Distribution: (Tables 1 and 8; Figures 24 and 25)

CORE CHOPPERS (N=5)

Form and Modification: All examples are ovoid cobbles modified by steep, hard hammer unifacial retouch on a single lateral margin (N=3) or bifacial retouch on a single lateral edge to create a sharp cutting edge (N=2). Some use wear crushing is evident along the retouched margins (N=3).

Metrics:		
	Length	8.1 - 13.8 cm
	Width	5.6 - 12.4 cm
	Thickness	3.1 - 5.8 cm
	Weight	156.2 - 1217.6 g

Lithic Type: Medium, dull quartzite (N=1); fine, lustrous quartzite (N=1); coarse, dull quartzite (N=3).

Distribution: (Table 8; Figures 24 and 25)

RETOUCHED FLAKES

LOCALIZED RETOUCH (N=28)

Form and Modification: Examples represented include secondary flakes (N=15) or decortication flakes (N=13) modified by localized, unifacial retouch on a single lateral margin.

Metrics:	Length	1.1 - 12.0 cm
	Width	1.0 - 9.7 cm
	Thickness	0.4 - 2.7 cm
	Weight	0.4 - 262.9 g

Lithic Types: Fine, lustrous quartzite (N=4); medium, lustrous quartzite (N=6); siltztone (N=5); black pebble chert (N=4); green pebble chert (N=2); white pebble chert (N=1); chalcedony (N=4); petrified wood (N=2).

Distribution: (Table 8; Figures 24 and 25)

PATTERNED RETOUCHED FLAKES (N=12)

Form and Modification: Examples represented are either made on secondary flakes (N=5) or decortication flakes (N=7). All are modified by patterned retouch; either unifacial, single lateral edge dorsal surface (N=8) or bifacial, both lateral edges (possible wedge, N=1); both lateral edges and distal margin (possible biface preform, N=1); both lateral edges and distal margin (possible wedge, N=1) and single extant lateral edge (N=1).

Metrics:	Length	1.7 - 10.4 cm
	Width	0.5 - 6.4 cm
	Thickness	0.3 - 1.8 cm
	Weight	0.5 - 165.5 g

Lithic Types: Fine, lustrous quartzite (N=3); medium, lustrous quartzite (N=2); siltstone (N=1); grey pebble chert (N=1); green pebble chert (N=1); petrified wood (N=1); chalcedony (N=2); brown pebble chert (N=1).

Distribution: (Table 8; Figures 24 and 25)

HAMMERSTONES (N=2)

Form and Modification: Both examples are ovoid cobbles modified by battering at both ends.

Metrics:		
Length	10.5 cm	12.8 cm
Width	5.7 cm	8.4 cm
Thickness	3.8 cm	6.2 cm
Weight	300.3 g	998.2 g

Lithic Type: Medium, dull quartzite; coarse, lustrous quartzite.

Distribution: (Table 8; Figures 24 and 25)

WEDGES (N=1)

Form and Modification: Irregular, expanding secondary decortication flake modified by bifacial soft hammer retouch right lateral edge to form wedge. Use wear crushing is evident on this margin.

Metrics:	
Length	2.9 cm
Width	1.9 cm
Thickness	0.8 cm
Weight	5.0 g

Lithic Type: Green pebble chert.

Distribution: (Table 8; Figure 24).

5.5.3.2 LITHIC TECHNOLOGY (Table 8)

TOOLS

Formed tools represent 6.1% (N=65) of the lithic assemblage. All were manufactured from locally available materials: quartzites (44.6%, N=29); siltstone (10.8%, N=7); pebble cherts (30.8%, N=20); chalcedony (7.8%, N=5); and petrified wood (6.2%, N=4). As is to be expected, most of the small formed tools (points, wedges and retouched flakes) were manufactured from cryptocrystalline materials, while the larger spall and core tools were manufactured from quartzite. As in all other components, there is a selection for lustrous, fine to medium-grained quartzites for tool manufacture. There is some suggestion that these quartzites were not as readily available and may have been obtained from sources north of the Red Deer area (I. Robertson: personnel communication 1981).

There are numerous similarities between this component and the Late Mummy Cave components in the East Basin. Both exhibit similar proportions of tool types and were exploiting almost identical raw materials. Both were likely campsites where a variety of activities occurred--tool manufacture, butchering, hide preparation and bone working.

DEBITAGE

The debitage represented in this assemblage suggests that all aspects of tool manufacture were undertaken at the site during this occupation, from core reduction to tool thinning, retouching and resharpening. Cores and core fragments represent 3.0% (N=30) of the debitage; decortication flakes 8.6% (N=86); secondary flakes 29.2% (N=291); thinning, retouch and resharpening flakes 28.5% (N=284) and shatter and nonidentifiable fragments 30.6% (N=305). These proportions are generally consistent with other components at the site, with the exception of the large quantity of shatter fragments. Generally, the occupation in the West Basin exhibits greater quantities of shatter debitage (see Component 6 +2 West Basin). This may be either a reflection of

the quality of the available material or the expertise of the manufacturers, though neither explanation is satisfactory.

As in all other components, the large percentages of unworked quartzite secondary and decortication flakes may represent unretouched expediency tools.

5.5.3.3 LITHIC TYPES (Table 8)

QUARTZITE

Quartzite represents 86.7% (N=920) of the total lithic assemblage, an even larger proportion exhibited in the other components. Of this, 20% (N=184) is fine grained; 52.3% (N=481) is medium-grained and 27.7% (N=255) coarse grained.

SILTSTONE

Local siltstone represents only 2.6% (N=28) of the total assemblage. Of this, 25% represented formed tools. The debitage was likely a reflection of tool manufacture rather than expedience use.

PEBBLE CHERTS

Local pebble cherts represent 6.1% (N=64) of the assemblage. Of this, 31.3% (N=29) are formed tools. As with the siltstone, the debitage was likely a reflection of tool manufacture.

CHALCEDONY

Chalcedony represents only 1.8% (N=19) of the lithic assemblage. Of this, 26.3% (N=5) are formed tools. The source for this material is unknown, but probably local.

PETRIFIED WOOD

This material, locally available represents 1.4% (N=15) of the total assemblage. Of this, 26.5% (N=4) are formed tools. Petrified wood appears in small but consistent quantities throughout the West Basin component but appears to be generally absent from the East Basin occupations.

VEIN QUARTZ

This material, of extremely poor flaking quality, represents only 2.2% (N=24) of the assemblage, all of which is debitage. This debitage likely reflects a single experimental and unsuccessful episode of lithic reduction.

5.5.4 FAUNAL DESCRIPTION

5.5.4.1 SPECIES REPRESENTED

Apart from bison, moose(?) (Alces alces) was represented by fragments of a left scapula blade and two fragments of a right humerus shaft. One fox (Vulpes sp.) was represented by a first mandibular molar.

5.5.4.2 MINIMUM NUMBER OF INDIVIDUALS, AGE, SEX AND SEASONALITY

Three bison were represented, one of 2.5 years in the West Basin, and in the East Basin one of less than 3.5 years and one of 4.5 to 6.5 years. Three mandibular molars, a left and right second and a right third indicated the age of the 2.5 year old bison. The M2 styles were unworn and there was little wear on the M3 first and second cusps. Three left maxilla molars (M1, M2 and M3) found in the East Basin indicated an age of 4.5 to 6.5 years. The M1 lingual style was worn to a circle, the M2 style was at the level of the cusps but unworn and the M3 style was still well

below the level of wear. Both M2 and M3 were still bilophodont (Wilson 1974:p. 157). Rates of epiphysial union indicated an animal of less than 3.5 years (non fused first phalanges) in the East Basin.

Not enough data was available to determine sex or seasonality. Tooth wear could possibly indicate an autumn kill.

5.5.4.3 BUTCHERING TECHNIQUE

Only 39 unidentifiable fragments were found (78.7 g), and of these only four were burned (1.9 g).

The cranium was represented by three maxillary molars (124.5 g) and the mandible by three mandibular molars (143.5 g). Eleven other tooth fragments weighed 5.8 g.

Apart from tooth fragments, only the hind limb was represented by a distal left tibia (BU-4), the anterior half of a left navicular cuboid (BU-6), a proximal anterior fragment of a left metatarsal (BU-5) and two left first phalanges (BU-1),. As in Components 3 and 4 it would seem the hind limb was brought articulated to the site and subsequently butchered through the distal tibia shaft to strip the leg muscles and the distal tarsals to remove the extremities. Good marrow bones (tibia and metatarsals) were probably fragmented to obtain the marrow.

Very little burned material (9%) was recovered which would seem to indicate bone boiling for grease extraction was not taking place.

5.5.4.4 DISTRIBUTION

Of the total faunal material recovered, 35% was found in the West Basin and 65% in the East Basin. All the burned fragments came

from 5N2W in the West Basin (near the hearth feature). Fifty-two percent of the material from the West Basin was in unit 0N7W while in the East Basin the material was more scattered with 16% in the northeast quadrant of Test 18 and 13% in the northwest quadrant of Test 5. The extremity fragments were found in the south half of Test 20. All non-bison material was found in the East Basin.

5.5.5 FEATURE DESCRIPTIONS

Stone features are clearly present in the West Basin and poorly represented in the East Basin. Hearth features are present in both the West Basin (Plate 8 and 9) (N=2) and the East Basin (N=1) (Plate 10). Concentrations of lithics and faunal material are also present in both basins.

EAST BASIN: Only 11 cobles are present (Figure 20). Five of these lie along an arcuate alignment on the north margin of the excavation (Test #21). Immediately south a hearth feature is present. Concentrations of material (discussed below under Floor Characteristics) appear to be associated with the features.

WEST BASIN: Stone features in the West Basin are reflected in the distribution of fist to cobble sized rocks (N=78) (Figure 23). These are largely concentrated in the east-central area of the excavations but extend along the floor of the excavation to the eastern margin of the excavations. Although cobbles are present in the west-central area of the excavation, their numbers are fewer. The linear nature of the excavated area makes it difficult to recognize areal type features. A concentration of relatively large cobbles in, for example, 3N7W and 3N6W appears to reflect the presence of a feature which could be interpreted as arcuate and could represent a portion of a buried ring. Hearths are present to the north and east of another arcuate stone feature (not mapped), lying in 4 and 5 North, 5 and 6 West.

The largest concentrations of lithic material lay within the area defined by these arcuate distributions of cobbles.

5.5.6 FLOOR CHARACTERISTICS

The analysis of spatial structure on the living floor is not here taken beyond the descriptive stage. The provenience data suggests a nonrandom distribution of material. The presence of features, arcuate stone alignments and hearths serves to define a number of activity areas.

5.5.6.1 EAST BASIN (Figures 21 and 22)

Quartzite tools and debitage (Figure 22) are densely distributed throughout the site. The heaviest clustering appears to be in the east end of the site (Tests 8, 9, 5-14). This area may represent a concentration of tool manufacturing activities. In Test 8, numerous small unworked cobbles were identified which may have been gathered here in preparation for core reduction. No features are associated with this area. Just to the west of this possible workshop area lies a partially disturbed area of large, unworked cobbles which might represent the remains of a buried tipi ring. This area extends through the north half of Test 21 to the east half of Test 13 and into the south half of Test 12. Contained within this arc in the southwest quadrant of Test 21 was a hearth feature characterized by fire broken rock and charcoal. Large quantities of fire broken rock were also scattered throughout this area beyond the hearth feature and indeed throughout the site beyond the ring arc (ca. 3-5 pieces per 2x2 m unit).

Cryptocrystalline tools and debitage (Figure 22) were extremely sparse throughout the component but generally follow the same patterns exhibited by the quartzites. Lithic material tends generally to be absent or sparse with the rock arc area and

exhibits its greatest density in Units 5, 9 and 14 to the east.

5.5.6.2 WEST BASIN (Figures 24 and 25)

The linear nature (Plate 11) of the excavation in this basin makes identification of spatial patterning extremely difficult. In the east portions of the site, where the greatest horizontal exposures were created, some spatial patterning is evident. The area appears to be enclosed on the west by an arc of large, unworked cobbles which may represent a portion of a buried and somewhat disturbed tipi ring. "Within" this arc lie the greatest concentrations of lithic debitage. Two hearths have been identified to the north and east of this arc, and numerous tool and debitage clusters are concentrated in this immediate vicinity. To the immediate northeast of these hearths are several scrapers and retouched flakes--this may represent a hide working area. A chopper and three spall tools were found to the south and west--this may have been a butchering and meat preparation area. Numerous small, unworked quartzite cobbles to the southeast of the hearth area may have been carried to the site, to be reduced for tool manufacture. Judging from the lithic concentrations, workshop areas were likely located around the hearth area and to the southwest, along the edge of the slope arc in the vicinity of the hammerstone.

5.5.7 AGE

No radiocarbon dates are available for this component. The stratigraphic location above the Ash and in the East Basin, its location above the Early Mummy Cave/Bitterroot cultural deposits and its stratigraphic location vis-a-vis the Late Prehistoric materials overlying the deposit, together with the presence of Oxbow projectile point forms suggest a clear chronological placement within the period between 3500 and 1500 B.C. (Reeves 1970).

5.5.8 CULTURAL AFFILIATION

On the basis of the diagnostic projectile points, this component has been culturally and chronologically related to the Late Mummy Cave-Oxbow complexes (ca. 3500-1500 B.C.). Reeves has suggested that the Oxbow Complex evolved out of the earlier side notched point complexes (Buchner 1980: 174). These basal concave "eared" points were the dominant form at Mummy Cave ca. 3660-3305 B.C. Studies of Oxbow components at other sites in the Northern Plains suggest that numerous traits correlate with the early Mummy Cave assemblages, for example, ovoid bifaces, pebble hammerstones, and fire broken rock (Buchner 1980:195). This association is also evident at Hawkwood.

The nearest comparable sites would be complexes identified in the Crowsnest Pass as the "Late Mapleleaf Subphase" (Loveseth 1980:186). As at Hawkwood, few changes are recognized between the Early and Late Mummy Cave periods. The presence of core choppers in the Oxbow component does suggest, however, that primary butchering was now being conducted at or near the site.

5.5.9 SITE TYPE

In terms of general configuration, the East and West Basins appear to diverge with respect to the presence of stone features and lithic scatters. Both, however, appear to have been heavily used campsites devoted to the processing of small kills.

5.6 LATE PLAINS -- COMPONENT 6 (Plates 4 and 5)

Component 6 was identified in both the East and West Basins. One hundred and thirty nine artifacts were recovered from the East Basin. These appeared to be concentrated in Tests 8 and 9. Formed tools, other than a spall, were not identified. In the

West Basin 339 artifacts were recovered with 21 of these representing formed tools. The assemblage included projectile points, bifaces and scrapers. The projectile points have been identified as Late Plains Side Notched projectile points.

5.6.1 STRATIGRAPHIC ASSOCIATIONS (Figures 5-8)

The cultural materials of Component 6 were, in both basins, associated with the uppermost sediments between the surface A horizon and depths of approximately 35 cm. Sally Stewart, in her more intensive study of these materials, suggests the existence of mixing between Components 5 and 6 (Stewart 1983, personal communication). I presume that such mixing is most pronounced towards the margins of the excavations as indicated above and/or due to recent faunaturbation.

5.6.2 LITHIC DESCRIPTION

EAST BASIN - LATE PREHISTORIC (Table 1)

5.6.2.1 FORMED TOOLS

SPALL TOOLS (N=1)

Form and Modification: This example is a large, ovoid decortication spall modified by steep (60 to 80 degrees) hard hammer percussion retouch on the dorsal surface.

Metrics:		
	Length	4.3 cm
	Width	4.0 cm
	Thickness	1.6 cm
	Weight	27.6 g

Lithic Type: Medium grained, lustrous pink quartzite.

Distribution: Test 5, Level 2, SE quadrant.

RETOUCHED FLAKES (N=3)

LOCALIZED RETOUCH (N=2)

Form and Modification: Both examples are secondary flakes marginally retouched on the dorsal surface on single lateral edge.

Metrics:			
	Length	3.9 cm	3.0 cm
	Width	2.3 cm	2.1 cm
	Thickness	1.1 cm	1.0 cm
	Weight	5.5 g	4.8 g

Lithic Type: Black siltstone (N=2).

Distribution: Test 15, Level 2, NW quadrant (N=2) (FIGURE 26).

PATTERNED RETOUCH (N=1)

Form and Modification: The single example is a secondary flake fragment modified by bifacial, soft hammer percussion retouch along the single extant lateral edge.

Metrics:	Length	1.9 cm
	Width	1.1 cm
	Thickness	0.5 cm
	Weight	0.7 g

5.6.2.2 LITHIC TECHNOLOGY (Table 9)

TOOLS

There was an extreme paucity of formed tools in the assemblage. None of the examples were diagnostic. Due to this paucity it is impossible to attempt to identify preferred lithic materials or overall site activity as expressed in the tool types. Thus, only a description of the identified tools has been offered.

DEBITAGE

As with tools, there was a paucity of lithic debitage recovered from this component. As in other components, however, the majority was local quartzite (75.5%, N=102). The remainder of the assemblage was also comprised of locally available materials: sandstone (2.2%, N=3); siltstone (14.1%, N=19); pebble chert (6.6%, N=9); heat treated chert (0.74%, N=1) and chalcedony (0.74%, N=1). The types of flake debitage suggest that all forms of lithic manufacture, from core reduction to tool resharpening and thinning, occurred at the site. Cores and core fragments

represented 2.9% (N=4) of the total assemblage; decortication flakes 25.2% (N=34), secondary flakes 24.4% (N=33), thinning retouch/resharpening flakes 36.3% (N=49) and shatter and nonidentifiable flakes 11.1% (N=15). These proportions are similar to those found in the other components.

5.6.2.3 LITHIC TYPES (Table 9)

Lithic types identified in the assemblage were all locally available. Proportions of these types are described above.

5.6.3 LITHIC DISTRIBUTION - WEST BASIN

5.6.3.1 FORMED TOOLS

PROJECTILE POINTS

LATE PLAINS SIDE NOTCHED (N=2) (Plate 19:1)

Form: Both examples have a symmetrical, triangular body outline, one with a slight lateral distal skew. Left shoulder--notch juncture--sharp acute (N=2), rounded acute (N=1); right shoulder--notch juncture--sharp acute (N=2); notches--shallow rounded (N=1); basal edge--notch junctures--sharp acute; and base--straight with shallow rounded medial notch (N=1); concave (N=1).

Modification: Both examples exhibit bifacial irregular, diagonal pressure retouch. Notches and bases are thinned and ground.

Metrics:			
	Length	1.93 cm	1.4 cm
	Width	1.37 cm	1.36 cm
	Thickness	0.32 cm	0.23 cm
	Weight	1.0 g	0.7 g

Lithic Type: Lustrous, fine white quartzite (N=1); Montana chert (N=1).

Distribution: 5N2W, Level 3, SE quadrant; 3N0E, Level 2, west half.

BIFACES

ASYMMETRICAL OVATE (N=2)

Form and Modification: Both examples are asymmetrical ovate in form with left lateral skew. In one example the distal end is broken. Both exhibit bifacial, soft hammer percussion retouch.

Metrics:			
	Length	2.46 cm	8.7 cm
	Width	1.79 cm	3.8 cm
	Thickness	0.65 cm	1.1 cm
	Weight	3.8 g	15.8 g

Lithic Type: Black pebble chert (N=1); fine, lustrous grey quartzite (N=1).

Distribution: 3N10W, Level 1, west half; 5N1W, level 3, south half (Figures 29 and 30).

BIFACE TIP FRAGMENT (N=1)

Form and Modification: Rounded tip fragment modified by bifacial soft hammer percussion retouch.

Metrics:		
	Length	1.28 cm
	Width	1.30 cm
	Thickness	0.48 cm
	Weight	1.1 g

Lithic Type: Lustrous, fine grey quartzite.

Distribution: 0N12W, Level 2, east half (Figure 30).

SCRAPERS

END SCRAPER (N=1)

Form and Modification: Secondary decortication flake modified by steep pressure retouch along distal margin, dorsal surface.

Metrics:		
	Length	3.80 cm
	Width	2.30 cm
	Thickness	0.90 cm
	Weight	12.2 g

Lithic Type: Dull, fine-grained, white quartzite.

Distribution: 5W1W, Level 2 (Figure 30).

SPLIT PEBBLE SCRAPERS (N=3)

Form and Modification: All are ovoid split pebbles modified by steep pressure retouch, dorsal surface, along a single lateral edge (N=2) or bifacial retouch distal end and left lateral edge (N=1). One example exhibits use wear crushing.

Metrics:				
	Length	6.78 cm	10.9 cm	2.46 cm
	Width	3.86 cm	1.45 cm	2.26 cm
	Thickness	2.69 cm	0.28 cm	0.83 cm
	Weight	72.6 g	0.8 g	7.2 g

Lithic Type: Dull, fine-grained, red quartzite (N=1); black pebble chert (N=2).

Distribution: 2N5W, Level 3; 3N6W, Level 2, east half, 3N0E, Level 3, east half (Figures 29 and 30).

RETOUCHED FLAKES

LOCALIZED (N=7)

Form and Modification: All examples are secondary (N=5) or decortication flakes (N=25) modified by localized, hard hammer percussion retouch on the dorsal surface; distal end (N=2) or a single lateral edge (N=2); or ventral surface, distal end (N=1) or a single lateral edge (N=1); or bifacial retouch on distal end and both lateral margins.

Metrics:					
	Length	5.27 cm	1.48 cm	3.39 cm	3.07 cm
	Width	3.55 cm	1.50 cm	3.13 cm	4.26 cm
	Thickness	1.09 cm	0.50 cm	0.98 cm	0.98 cm
	Weight	26.0 g	1.7 g	16.7 g	16.7 g
	Length	9.10 cm	3.25 cm	4.93 cm	
	Width	7.41 cm	1.95 cm	3.60 cm	
	Thickness	2.37 cm	1.19 cm	1.10 cm	
	Weight	229.9 g	9.5 g	33.4 g	

Lithic Type: Lustrous, coarse, grey quartzite; dull, fine, white quartzite; lustrous, fine, green quartzite; lustrous, fine, red quartzite; lustrous, medium, yellow quartzite; black pebble chert; lustrous, medium, grey quartzite.

Distribution: 5N1W, Level 3; 2N7W, Level 4, east half; 5N13W, Level 3, north half; 6N10W, Level 2, south half; 3N16W, Level 1, east half; 0N4W, Level 3; 0N4W, Level 3, south half (Figures 29 and 30).

PATTERNED (N=4)

Form and Modification: All examples are secondary (N=3) or decortication flakes (N=1) modified by soft hammer percussion patterned retouch either unifacial along the dorsal surface, distal margin (N=1); ventral surface right lateral edge and distal end (N=1); or bifacial--dorsal surface, right and distal margins and ventral, left lateral edge (N=1); and dorsal surface, left lateral and ventral surface, proximal end (possible drill point) (N=1).

Metrics:					
	Length	3.15 cm	3.62 cm	4.16 cm	2.65 cm
	Width	2.84 cm	2.51 cm	3.18 cm	1.63 cm
	Thickness	1.21 cm	0.86 cm	1.08 cm	0.70 cm
	Weight	12.3 g	10.8 g	12.8 g	5.5 g

Lithic Types: Lustrous, coarse, grey quartzite; dull, fine, red quartzite; lustrous, coarse, rose quartzite; petrified wood.

Distribution: 1N1W, Level 3, south half; 2N5W, Level 2; 0N12, Level 2, west half (Figures 29 and 30).

<u>WEDGES</u> (N=2)

Form and Modification: Secondary (N=1) or decortication (N=1) flakes modified by bifacial pressure retouch at distal end to form wedge cutting edge. One example exhibits use wear crushing.

Metrics:			
	Length	2.31 cm	3.50 cm
	Width	1.88 cm	2.07 cm
	Thickness	0.63 cm	1.05 cm
	Weight	3.7 g	12.3 g

Lithic Type: Lustrous, fine, green quartzite; black pebble chert.

Distribution: 3N6W, Level 3, east half; 3N10W, Level 1 (Figures 29 and 30).

5.6.3.2 LITHIC TECHNOLOGY (Table 10)

TOOLS

The majority of formed tools in the assemblage were manufactured from locally available raw materials: quartzite 68.2% (N=15), pebble chert 22.7% (N=5) and petrified wood 4.5% (N=1). As in all other components the preferred quartzite grade for tool manufacture was the fine-grained, lustrous variety. In contrast to the other components, though, there was a complete lack of large, unifacial spall tools and choppers. Only one formed tool, a late prehistoric projectile point, was manufactured of imported material (Montana chert).

DEBITAGE

All the lithic debitage in the assemblage consisted of locally available materials: quartzite 97.4% (N=293); siltstone 1.3% (N=4); pebble chert 3.2% (N=5); chalcedony 0.6% (N=2) and petrified wood 1.2% (N=4). As in other components, the distribution of types of debitage suggests that all stages of lithic manufacture were taking place at the site: cores and core fragments 5.4% (N=17); decortication flakes 13.0% (N=41); secondary flakes 18.0% (N=57); thinning and retouch flakes 21.1% (N=67) and nonidentifiable fragments 0.6% (N=2). The only exception to this distribution was the vast quantity of shatter fragments 42% (N=133), which is inconsistent with the components in the other basin. The majority of the shatter fragments are quartzite 95.5% (N=127) suggesting either that the cobbles utilized were of extremely poor flaking quality, or that for some reason the quality of workmanship was extremely poor. The latter

seems unlikly, as the formed tools were consistently of the same quality as those found in other components.

5.6.6.3 LITHIC TYPES (Table 10)

MICROCRYSTALLINES

QUARTZITE

Local quartzite comprised 90.8% (N=308) of the total lithic assemblage. Of this, 25.9% (N=80) was fine-grained, 44.1% (N=136) medium-grained and 29.9% (N=92) was coarse-grained. Tools comprised 4.8% (N=15) of the quartzite assemblage.

CRYPTOCRYSTALLINES

SILTSTONE

Local siltstone comprised only 1.2% (N=4) of the assemblage. There were no formed tools of this material.

PEBBLE CHERTS

Local pebble chert comprised 5.6% (N=19) of the total assemblage. Formed tools accounted for 26.3% (N=15) of the chert assemblage.

CHALCEDONY

Chalcedony accounted for only 0.5% (N=2) of the lithic assemblage. There were no formed tools of this material.

PETRIFIED WOOD

Petrified wood accounted for only 1.5% (N=5) of the total lithic assemblage. Formed tools comprised 20% (N=1) of this material.

MONTANA CHERT

This material, probably imported from a source in central Montana near Helena, was found in only one example of the lithic assemblage--a projectile point. The lack of debitage suggests that the tool itself was manufactured elsewhere.

Overall, the proportions of lithic types represented in this assemblage suggest that local quartzites were the preferred material due to their close proximity to the site. The large proportion of debitage in relationship to tools may indicate that cobbles were being reduced for large flake and core expediency tools. Pebble chert debitage, on the other hand, was probably primarily a reflection of tool manufacture. The small proportion of cryptocrystallines in both EAst and West Basins during the late prehistoric occupation may suggest that these pebble cherts were not as readily available as they had been in earlier periods.

5.6.4 FAUNAL DESCRIPTION

5.6.4.1 SPECIES REPRESENTED

Only bison were present in Component 6.

5.6.4.2 MINIMUM NUMBER OF INDIVIDUALS, AGE, SEX AND SEASONALITY

Two bison were indicated by identifiable elements. Fusion rates would place the age of the bison in the East Basin at more than 5 years (distal radius) and that in the West Basin at more than 3.5 years (fused first phalanges). Not enough data was available to determine sex or seasonality.

5.6.4.3 BUTCHERING TECHNIQUES

Only seven unidentifiable fragments were found (18.3 g) of which only one (1.7 g) was calcined.

Only one tooth fragment (1.2 g) was found to represent the cranium. No identifiable vertebrae or rib fragments were present.

The fore limb was better represented than in earlier components. The distal end of a left radius (BU-11), a left ulna shaft fragment (BU-3), and a left lunate, cuneiform and magnum (BU-1) were present. All elements articulated. Two second phalanges (BU-1) were also found in the area of the fore limb elements, and one could assume the articulated limb was brought to the site after the radius was segmented from the humerus and the meat stripped. The extremities could have been removed through the carpals. The radius may have been fragmented for marrow extraction.

The hind limb was represented by a distal posterior/medial shaft fragment of a left femur (BU-31) and the proximal end of a right metatarsal (BU-4). The femora could possibly have been fragmented for marrow extraction.

Only one calcined fragment was found suggesting no bone boiling was taking place.

5.6.4.4 DISTRIBUTION

Sixty-eight percent of all faunal material in Component 6 was found in the East Basin and 32% in the West Basin. Identifiable fore limb elements were all found in the northeast quadrant of Test 8 and the east half of Test 6 in the East Basin. The femoral fragment and a first and second phalange were found in

the West Basin. The metatarsal fragment was found in the southwest quadrant of Test 16 in the East Basin.

5.6.5 FEATURES (Figure 28)

No features were recognized within the floor areas of either basin.

5.6.6 FLOOR CHARACTERISTICS (Figures 26-30)

In the West Basin, the artifactual materials were found to be diffusely scattered about the basin without any apparent tendency to concentrate. In the East Basin, a poorly expressed concentration occurs in Tests 8 and 9; otherwise concentrations were lacking.

In the West Basin all lithic tools and debitage were sparsely distributed throughout the excavated portions of the basin such that no spatial patterning was evident. No hearth features or structures were identified.

In the East Basin both quartzite and cryptocrystalline debitage tend to cluster in Tests 8 and 9; otherwise there is only a very thin scatter of lithic material throughout the rest of the site. No features were associated with this assemblage.

5.6.7 AGE

No radiocarbon dates were obtained on this component. Diagnostic projectile points were utilized to provide an estimate of chronology. In general, tools were absent from the East Basin and the chronology is based on a similar depth of burial as the West Basin. Further, a surface ring occupation in and near to the basin suggests a relatively recent occupation. Late Plains Side Notched projectile points (N=2) were identified in the West

Basin. These suggest a Late Plains occupation 500 A.D. to 1500 A.D.

5.6.8 CULTURAL AFFILIATION

No culturally or chronologically diagnostic artifacts were found associated with the East Basin. It was probably late prehistoric, judging from its stratigraphical association with the unexcavated late prehistoric tipi rings and with the late prehistoric component in the West Basin.

The paucity of lithic artifacts in the West Basin is consistent with other late prehistoric sites in similar environments, at prairie level north of the Bow River in the Calgary area (Reeves and Stewart 1981, Thompson, Reeves and Head 1981). The sparse lithic scatter in both basins is probably a reflection of lithic activity areas external to the unexcavated surface tipi rings (Figure 2). Two diagnostic Late Plains Side Notched points provide a reliable indicator of chronology.

Stratigraphically, both the East and West Basin occupations appear to be chronologically associated.

5.6.9 SUBSISTENCE

The faunal inventory again suggests a primary use of bison. A minimum of two bison were identified in the component. Again, tooth elements and limb elements form the basis of the collection. Further, the left side of the animal is strongly represented with the elements of the right side limited to a metatarsal. The hind limb was represented but in contrast to other faunal assemblages at the site, the fore limb was relatively well represented. The fore limb elements were found to be concentrated in Test 8, and 6 of the East Basin.

5.6.10 SITE TYPE

The generally diffuse nature of artifactual distribution, the low density of artifactual material and a lack of features and lithic scatters suggest the presence of a transitory campsite expediently located for the processing of an animal. Light butchering is represented according to current faunal interpretations.

5.7 OTHER TEST EXCAVATIONS

Aside from the two basins described above, two smaller test areas were excavated to help determine the extent of occupation beyond these basins.

Western Test Units (See Figure 2)

The small area of these test units, and compacted nature of the stratigraphy have made the identification of distinct components impossible. Finds of formed tools and debitage suggest that the occupation of the western basin extended at least as far as these tests. The data from these tests are presented in Table 12.

Test 10--Easternmost Basin (See Figure 2).

This 1x2 m test unit was located in the basin east of the "East Basin". Again, the stratigraphy was poorly defined and difficult to assess. The Mazama Ash Horizon was deeply buried. The unit was abandoned below the ash due to the extremely wet nature of the clays. The data from these tests are presented in Table 11.

6. COMPARISONS

The Hawkwood site provides a relatively unique window on the prehistory of the Calgary region. Alone, the Hawkwood site provides evidence for continued occupation and use of the Nose Hill Uplands over a span of 8,000 years. Together with the results of studies on properties within a mile of Hawkwood, our understanding of culture change and landuse of the Nose Hill Uplands has been considerably refined. These lands, proposed for development by Melcor Developments Ltd. and Carma Developers Ltd., have yielded a remarkably complete record of the holocene period (Head and Van Dyke 1982 and Van Dyke 1980b). The archaeological record is perhaps, on the one hand, unique in suggesting the congruence of a number of factors which proved to be irresistible to prehistoric hunters. On the other hand, the archaeological resources of the Nose Hill Uplands may simply be representative of the utilization and occupation of the prairie level surrounding the Bow River valley, most of which has been previously disturbed and/or the historical resources destroyed by historic agricultural practices.

The earliest identifiable component at Hawkwood rivals the Mona Lisa site, EgPm-3, in age. The Mona Lisa site, until now, was the earliest dated prehistoric site in Calgary (Wilson 1974, 1980). In addition, the Hawkwood sequence exhibits evidence of subsequent early and late Mummy Cave occupations as well as an Oxbow occupation. Other prehistoric sites within the general vicinity provide complementary evidence for Oxbow and Hanna occupations, EgPm-152 and EgPm-150 respectively. A potentially good McKean component is also known to be present in a sedimentary basin of similar form less than a mile to the north, EgPm-150. Pelican Lake, at EgPm-151, is also represented in the general area of the study. The late prehistoric period is only weakly expressed in the excavated assemblages at Hawkwood.

However, everywhere in the area of the study, the Late Plains cultures are represented by butchering sites, large numbers of stone circle sites, cairns and similar features.

The framework which constitutes Alberta Prehistory consists of a series of cultural, historical units defined on the basis of formal similarities with archaeological phases, subphases, components and assemblages which, for the most part, are located elsewhere. Sequent changes in the technological characteristics of assemblages permit us to distinguish separable periods based on the assumption that cultures exhibit internally consistent patterns of formed tool manufacture. Comparison of these historical periods with similarly defined units elsewhere permits speculation on the origin of the cultures represented. Conventional interpretation allows us to specify, in this manner, the gross mechanics of cultural change (e.g., migration, replacement and expansion), but such interpretations are less well suited to the recognition or explanation of the processes which drive internal cultural change, adaptation, or conversely, persistence.

The archaeological record of the Northern Plains consists of an environmental record on which broad technological changes have been mapped. In very general terms the technological traditions (i.e., lanceolate spears to notched atlatls to small arrow points) are loosely correlated with the environmental periods (i.e., early Post Glacial, Altithermal and Neo-glacial). On to this framework, archaeologists have mapped the place of specific formal units of similarity (e.g., Pelican Lake, Oxbow or McKean). Explanation of the sequent forms is attributed to changes in the environment. For example, archaeologists are split over the consequences of the Altithermal. Some believe changes to be the result of the "altered environmental conditions during this period of environmental stress" (Reeves 1979) while others confidently suggest a cultural hiatus (Buchner 1980). Similarly,

the onset of the Neo-glacial period is believed to have resulted in a substantial re-population of the Northern Plains (Buchner 1980) or at least a modification of the cultures inhabiting the Northern Plains (Reeves 1979).

The cultural historical mapping of Northern Plains peoples provides a basic framework. Together with contemporary opportunistic and environmentally possibilist models, a general understanding is also available. On the other hand, the basic units tend to blind one to the subtle play of a host of other factors which are evidenced by the degree of variation exhibited within each of the cultural historical units.

Against this backdrop, the cultural reconstruction of a single prehistoric site such as Hawkwood is handicapped. As a relatively unique occurrence in the Calgary region, it is far simpler to just place the recognizable components into the framework as now understood and to accept the plausible explanation offered up for cultural change on the Northern Plains as a whole. Viewed in another framework, however, the archaeological record as summarized below for the Hawkwood site demonstrates convincingly the persistence of an exploitive pattern, although poorly understood, which transgresses the technological distinctiveness of each of the cultural periods represented at the site.

It is a truism that Northern Plains people depended heavily on the exploitation of bison and that the basic strategies of exploitation have remained essentially the same for a period well over 10,000 years. Although the patterns of exploitation may have been refined on occasion and the schedule of movement and utilization may have been modified, the overall characterization of Plains peoples as big game hunters rather than foragers (Malouf 1958) or archaic peoples (Frison 1978) is evident. In more than five years of relatively intensive archaeological study

carried out within a consulting framework, little evidence has been found for a broad based pattern even partially dependent on gathering, collecting, fishing or other pursuits. Although these activites may have been practiced, they were never a major factor in determining the movement of human groups. Quite the contrary, our present evidence suggests that groups moving onto the plains from elsewhere, and practicing quite disparate economic orientations, were quickly absorbed into the characteristic economic orientation of Plains hunting. This theme is as dominant as that of the Great Basin or the Boreal forest, both of which also serve to mold the inhabitant and to resist alternative adaptations.

However, it should be expected that minor changes in procurement strategies and schedules would mark the different cultural periods, and geographic areas particularly as they reflect major changes in the climatic regime and minor changes due to fluctuating, episodic and capricious changes in bison populations and behavior.

Notwithstanding the above, the Hawkwood site together with similarly located sites throughout a small portion of the Nose Hill Uplands, provide evidence for a similar and persistent pattern of exploitation throughout the known archaeological record.

The first known occupants of the Calgary region and for that matter, Alberta as a whole, may have been bearers of the Clovis Culture (Christenson 1976, Gryba 1983 and Ronaghan, Hanna and Thorpe 1983) or a regional variant of that culture (Ball 1983). Only one known example of a Clovis projectile point has been excavated from a site in Calgary (McIntyre and Reeves 1975a). Although these people no doubt used the Nose Hill Uplands, there is presently no evidence of this occupation.

The first group known to have occupied the Nose Hill Uplands has been attributed to the Plains/Mountain Complex. This complex lacks clear definition. In its many guises, the Plains/Mountain Complex exhibits considerable variability. In our current systematics, the Plains/Mountain Complex serves to convey a tentative relationship between a variety of far flung cultural entities which contain Agate Basin, Lusk, stemmed lancoelates and sometimes notched atlatls in varying proportions and in combination with roughly similar nonprojectile point assemblages. The Plains/Mountain Complex owes its origins to the Agate Basin Complex on the Plains (Reeves 1979). At the onset of the Altithermal, the lanceolate complex "displaces or absorbs the indiginous Cordillieran complex" (Reeves 1979) throughout a wide area of the Rocky Mountains and the Plateau (Swanson 1962). Alberta type sites for the complex are, for the most part, restricted to excavated sites in the Crowsnest Pass and Waterton National Park (c.f., Loveseth 1980, Reeves 1979, Kennedy 1982). There, the typical range of projectile points include Agate Basin, Pryor stemmed and Lusk (Ibid.:181) in association with large bifaces, large unifaces, dorsally unfinished medium to large end scrapers, and a significant number of retouched flakes. In Bellevue, Driver (1978) reports a date of 8,020 +/- 200 B.P. (RL-448) on a Ptolemy Subphase component of the Plains/Mountain Complex at DjPo-81.

Other sites containing similar assemblages include DgPm-1 in Waterton (Reeves 1972 (Agate Basin, Lusk, Lerma and Scottsbluff)), DlPo-20 (Reeves and Dormaar 1972 (Lusk)), EhPs-20 and EhPs-56 (ARESCO 1977 (Agate Basin and Scottsbluff)), EhPs-2 (Reeves and Murray 1974), EhPu-1 and EhPw-3 (Christenson 1971 (Agate Basin)), and EhPw-2 (Damp, Connolly and Smith 1980 (Pryor stemmed)). The major point of similarity between Hawkwood and the above sites is the presence of Lusk and well made, bi-pointed lanceolate bifaces. The major point of departure is the presence of Salmon River Side Notched and other forms which are more

characteristic of the subsequent Bellevue Hill Subphase in Waterton National Park (Reeves 1972) or the Mapleleaf Subphase in the Crowsnest Pass (Loveseth 1980). A relatively early date of 8,100 +/- 190 B.P. (RL-774) has been estimated for at least one site reported to be affiliated with the later Mummy Cave culture. However, the collection at the site, DjPo-9, is clearly more similar to typical Mummy Cave assemblages (Calder, et al 1980).

A radiocarbon age estimate of 8250 +/- 330 B.P. (RL-1554) has been obtained on the Hawkwood assemblage attributed to the Plains/Mountain Complex. The characteristic projectile points include Lusk, Salmon River Side Notched and a stemmed lanceolate. The mixture in combination with the radiocarbon estimate suggests, tentatively, a transitional period between the Plains/Mountain and the subsequent Early Mummy Cave complex. This transition and continuity between the two should be expected in both the mountains and plateau regions (c.f., Swanson 1962). Given the direction of the movement of ideas during this period of time, one might, perhaps prematurely, suggest using Swanson's variation of the term (i.e., Mountain/Plains complex) for the latter stage of this period and retaining Reeves' variation of the term for the early part of the period (i.e., Plains/Mountain). An overall generic term for both periods would of course be required.

In Waterton, the Crowsnest Pass and elsewhere along the Rocky Mountains, the Plains/Mountain complex is characterized by a flexible strategy of subsistence involving a schedule of movement which brought hunters into association with small, but highly productive, biotic patches dominated by sheep, goat, deer, elk, and bison in varying proportions, at least in the mountains from which the majority of our evidence has been accumulated. At the Hawkwood site this strategy is expressed as an exploitation limited to bison, the dominant ungulate, seasonally, within the area. The site represents a campsite/processing area distinct

from, presumably, anearby kill/butchering sites. Only light butchering is evidenced as the remains suggest only that stripped meat and, perhaps, articulated limbs were returned to the site area. In terms of use, this pattern differs from a kill/butchering type of site as represented in Locality A of EfPm-3 (the Mona Lisa Site) in the Bow River valley. There, the earliest component was dated to 8090 +/- 150 B.P. (GSC-1209) (Wilson 1974). On the other hand, EgPm-146, which is also located on the Nose Hill Uplands, exhibits a pattern of remains similar to EgPm-179 and is believed to be of a similar age (Head and Van Dyke 1982).

At none of these examples is there evidence for the season of use. The determination of the season of use for the Hawkwood component requires an inference based on limiting possibilities given our knowledge of bison behavior and the general characteristics of the Nose Hill Uplands. As bison would not have occurred in sufficient numbers during the summer to warrant the establishment of an exploitive pattern centering on the Nose Hill Uplands, one may assume that the major use of the Nose Hill Uplands would have occurred in the winter or early spring when bison would be expected to occur in sufficient numbers. Demonstration of a winter or early spring occupation is dependent on the presence of fetal bone. The rarity of fetal bison bone in archaeological sites can be explained in a variety of ways, regardless of the season (Driver 1982). On the other hand, an overlying component contains such material. Further, the Mona Lisa site in the Bow River valley of the same age, has also produced fetal bone (Wilson 1980).

In a similar fashion we would argue, on the basis of contemporary climatic conditions, that the Nose Hill Uplands provided a favorable habitat for both bison and man. The grass covered uplands, particularly the south facing slopes of Nose Hill, are repeatedly blown clear of snow during the winter. Similarly,

Chinooks and a generally milder winter climate create unusually favorable conditions for bison foraging and human occupation.

Assuming the presence of a kill/primary butchering site nearby, perhaps in a continguous slough, one would assume that the Hawkwood site served as a "meatcamp". This is supported by the floor characteristics which suggest the presence of a shelter, hearths and clearly defined activity areas. This would suggest that a habitation site was located elsewhere, perhaps in the valley below. On the other hand, had a pattern of transhumance been established by this time, one might suggest that the Hawkwood area served simply as a way station going to or from the mountains.

The "Mountain/Plains" component at Hawkwood was succeeded by another occupation which, in this instance, lacked diagnostic tools. Two radiocarbon dates provide evidence which suggests an affiliation with early Mummy Cave. Dates of 6820 +/- 280 (RL-1277) and 7030 +/- 210 (RL-1276) were obtained on the component. Stratigraphic data in combination with these dates tend to support that conclusion.

The subsistence strategy evidenced in Component 2 of the Hawkwood site complements in many ways that which was identified in the underlying Plains/Mountain Component. The faunal assemblage differs in that it includes fetal bison and deer. The deer is a common element of this biotic zone and is thus expected. The fetal bone is a rare element in faunal assemblages and has considerable value as it may confirm a winter/late spring occupation.

Overall, the occupation does not exhibit strong evidence of structured use. Activity areas in the form of lithic concentrations and similarly distributed faunal concentrations give the impression of a less intensive utilization of the site

area as compared with the earlier component. A small distribution of cobbles does, however, suggest the presence of a shelter. Although hearths are absent, a relatively large number of burned bone fragments suggests the likelihood of a nearby, unexcavated hearth. The lack of diagnostic tools or characteristic similarities between the non-projectile point assemblage and other early Mummy Cave sites are discouraging; however, the radiocarbon estimates provide a convincing demonstration of the affiliation given our current understanding of the cultural history of the Nose Hill Uplands.

Component 3 at the Hawkwood site lies immediately below the Mazama Ash deposit (ca. 6600 years). The component is attributed to the Early Mummy Cave Complex. Although lacking diagnostic projectile points, bracketing dates of 7030 and 6820 years ago on Component 2 and the age of Mazama Ash which overlies the component provide relatively precise confirmation of the cultural affiliation. In terms of the non-projectile point assemblage, Component 3 exhibits general similarities, particularly with respect to a high percentage of retouched flakes (Loveseth 1980:186).

In overall appearance, Component 3 shares much in common with Component 2. Both contain evidence of structures, while both lack hearth features, soil staining and other evidences of fires. Unlike the high number of burned bones represented in Component 2, Component 3 lacks even this circumstantial evidence of hearths. A concordance of concentrations of lithic and faunal concentrations with cobbles, believed to represent a structure, suggest the presence of structured activity patterns.

Again, light butchering seems to be indicated by the faunal assemblage and a winter/spring occupation is argued for logical reasons cited above.

Component 4 was found to lie immediately above the Mazama Ash deposit and is similarly attributed to an Early Mummy Cave occupation. A basal date of ca., 6600 years and the presence of an overlying Oxbow Component (Late Mummy Cave) are suggestive of the affiliation. The stratigraphic position of the component relative to the Mazama Ash and a basic continuity of the assemblage characteristics with Component 3 below the ash provides a somewhat stronger argument for an early Mummy Cave affiliation. This is complemented by the presence of two diagnostic Bitterroot side notched projectile points and a moderate number of retouched flakes (N=9).

Apart from the unusual occurrence of an elk phalanx, only bison were represented in the faunal assemblage. The faunal assemblage again is representative of light butchering, and like Component 3, contained little in the way of burned bone. Unlike lower components, cobbles on the living floor do no appear to be related to a shelter. At best they can be presumed to represent source rock for tool manufacture which is strongly expressed in the component or as use as anvils. Although concentrations of faunal material and lithics occur, they do not appear to be associated with each other.

Although manufacturing activities tend to be strongly expressed, most other lines of evidence suggest a subsistence pattern consistent with all earlier components. Perhaps the presence of projectile points and overrepresentation of debitage is a function of the nearness of the kill site.

Component 5 at the Hawkwood site contains a Hanna and seven Oxbow side notched projectile points, scrapers, spall tools, wedges and a high percentage of retouched flakes. The component lies clearly above Bitterroot Phase materials and stratigraphically underlies Late Prehistoric period materials at Hawkwood. The stratigraphic placement of the component similarly appears to be

lower then Pelican Lake, McKean and similar Late Middle Prehistoric materials in other sites on the Nose Hill Uplands (e.g., EgPn-150 and EgPn-151). Together this suggests an age between 3500 and 5500 years ago, and probably within the earlier portion of that span of time.

The component contains some evidence for the presence of a shelter, hearths, the earliest occurrence of fire broken rock in large numbers, and lithic concentrations associated with the hearths.

The faunal assemblage was relatively small and like most earlier components contained only small numbers of burned bone. The faunal assemblage from the two living floors contained evidence of fox and moose in addition to three bison. The minimum number of individuals and ages of the bison were calculated from a variety of teeth in the faunal assemblage. Other than the teeth, however, only the left hind limb is represented. Thus, a light butchering pattern appears to be indicated. The appearance of elements identified as moose is unusual, but is not considered further here.

The subsistence pattern for the component appears to duplicate that found in earlier components. The East and West Basin assemblages appear to diverge only as measured by the presence of stone features and the specific nature of lithic concentrations. The presence of core choppers suggest a closer proximity to the primary butchering area, and the presence of large numbers of fire broken rock suggests stone boiling. Overall, the constituents of the component suggest a similar subsistence pattern, but a more structured encampment, than that expressed in earlier components.

The uppermost excavated component at Hawkwood is attributed to a Late Prehistoric occupation. Missing at Hawkwood is evidence of

the earliest stages of the Tunaxa Tradition. These, however, are represented at a host of other sites on the Nose Hill Uplands (e.g., EgPm-146, EgPm-150 and EgPm-151).

The Late Prehistoric period is poorly expressed within the basins excavated. The affiliation of the component was determined through the presence of Late Plains Side Notched projectile points in the West Basin. The paucity of archaeological remains within the excavated component is consistent with other late prehistoric sites in similar environments which have previously been excavated within the Calgary region. Although evidence of shelters was absent, nearby unexcavated tipi rings could well be associated with the component. Similarly, these areas of the site lack clearly defined activity areas. Light butchering is indicated by the faunal assemblage which is limited to evidence for two animals, again only by limb elements and teeth.

6.1 DISCUSSION

The Hawkwood site contains evidence of a minimum of six discrete occupations which span over 8000 years of Alberta's prehistory. Evidence of the earliest lanceolate cultures on the Plains is missing from the sequence, but this is no doubt due to the small sample of sites which have been excavated on the Nose Hill Uplands. Sampling also results in a gap representative of the earliest stages of the Tunaxa Tradition which is, however, represented elsewhere on the Nose Hill Uplands.

The age of each of the components is either directly calculated by means of radiocarbon estimates or reasonably bracketed by such dates. Those components lacking precise chronological estimates either contain diagnostic projectile points or can be stratigraphically placed within a millenia of their true age.

All but one of the components can be attributed to a known unit

within the cultural systematics which is conventionally utilized for the Northern Plains. Component 2, however, is dated by two radiocarbon assays. Assuming no surprises, the calculated age permits us to attribute the component to similarly aged components elsewhere. The assemblages of the six components each exhibit characteristics which conform to the age/cultural estimates provided by projectile points, stratigraphy, or direct age calculation. The one possible exception, the Plains/Mountain Component, Component 1, contains an incongruent occurrence of a Salmon River side notched projectile point in association with the Lusk point and a finely made, large bi-pointed biface. This is explained here, however, as a transitional component between the Plains/Mountain and the Mummy Cave complexes.

Notwithstanding the cultural and chronological dissimilarities, the general configuration and subsistence patterns exhibited within the components are remarkably similar through time. Overall, we can say with some confidence that the basins of the Hawkwood site were utilized as campsites in the proximity of kill/primary butchering sites and also, perhaps, separate from areas of more intensive activities associated with the reduction of the carcass.

For example, all other considerations aside, the faunal assemblage from each of the components is suggestive of light butchering designed to meet the needs of immediate consumption. In the majority of cases the faunal assemblage is dominated by limbs and, further, a preference for either left or right limbs and/or front or hind limbs brought to the campsite in articulition. This suggests that the kill site was located nearby and that the limbs of the exposed side of the animal carcass were removed as a whole. Had the limbs been stripped of meat at the kill site, then the only significant use of the skeletal material would have been for marrow extraction which in any case was carried out at the campsite. The lack of other elements suggests

that more or less complete carcass reduction was undertaken elsewhere. Perhaps the stripped meat was dried by exposure or from poles on the exposed flank of the ridge to the south of the campsite.

In addition to the limb elements, each of the components also exhibited bison teeth without corresponding evidence for mandibular or maxillary bone elements. This absence is perhaps due to the vagaries of preservation, or conversely, to activities the function of which is not associated with the reduction of the carcass for meat.

Most of the components also share, in common, evidence for the presence of shelters and structured activities in the form of arcuate alignments of stone and in concentrations of lithic materials and faunal elements. Together, these suggest that the campsite was occupied for a reasonable length of time. The size of the various assemblages, although significantly different, tend to support this assumption. On the other hand, a general absence of burned and calcined bone, except for Component 1, suggests that the occupation was not so long as to permit the accumulation of sufficient bone to make worth while the processing of bone fragments for bone grease, a time consuming task requiring substantial amounts of bone (Binford 1978). The relatively large number of burned bone fragments associated with Component 1 are no doubt due to an activity which did not involve bone grease preparation. Had such preparation been undertaken, one would likely also find evidence of bone boiling in the form of fire broken rock. Such evidence is lacking in all but the latest components.

Direct evidence for seasonality is absent from all but one component, however, it is reasonable to expect that exploitation of the Nose Hill Uplands was limited to the fall/winter/spring during which time bison would be expected to occur. Whether the

activities practiced on the Nose Hill Uplands were associated with a base camp in the Bow River valley or were themselves a significant part of a seasonal round is not presently answerable, but the presence of moose (Component 5) and elk (Component 4) provides circumstantial evidence that a prior use was made of the river valley or the mountains and that the seasonal round did not likely involve an intermediate base camp, given that their occurrences were not the result of scavengers.

Although for the most part a just-so story, we have tried to argue that the occupation and utilization of the Nose Hill Uplands was a consistent and regular part of the nomadic cycle of the Plains hunter of the Calgary region throughout the past 8,000 years. The Hawkwood site provides circumstantial evidence for a consistent pattern of adaptation not influenced by the Altithermal, Neo-glacial or other external factors. For the source of variation which is responsible for the waxing and waning of styles of weaponry and tools; the movement, expansion and replacement of peoples, and cultural change as we understand it, we would do well to look at factors involving other components of the seasonal round.

7. SUMMARY AND CONCLUSIONS

In April, May and June of 1979, an Historical Resources Impact Assessment (ASA Permit Number 79-08) was carried out of the Phase I parcel of the Crowchild II development. During the course of the Historical Resources Impact Assessment a prehistoric site designated as EgPm-179 was identified and recorded. The site is located in an area of hummocky moraine immediately behind (north) the edge of the Uplands and overlooking the south facing flanks of Nose Hill. The site area consists of two major depositional/depressional features, the saddle which connects the latter and the ridgelike features which enclose the basins. Surface indications of the site include three tipi rings.

Four test units were excavated within the depressions. The test excavation yielded evidence of at least three prehistoric components. The uppermost component was believed to be associated with the ring encampment. A lower component was found to lie immediately above the Mazama Ash. The basal component was found to be associated with a paleosol underlying the ash. The basal component was dated by radiocarbon assays. Two applicable dates were obtained, 7030 and 6820 years B.P. The middle component is estimated, on the basis of its stratigraphic position relative to the Mazama Ash deposit, to be greater than 5500 years old.

On the basis of the results obtained from the test excavation it was recommended that impacts to the site be mitigated by conservation excavations. The Archaeological Survey of Alberta concurred with the recommendations. Archaeological studies were initiated during the late winter of 1980/1981 and concluded by May 1, 1981, the start up date for construction. Excavations consisted of an initial trenching of the two principal basins followed by an en-bloc excavation. Ultimately 132 square metres were excavated. Of this total, 70 square metres was excavated in

the West Basin and 62 square metres was excavated in the East Basin. In addition a 1x2 metre test was initiated in a shallow depression at the east end of the site. The test was abandoned when saturated clays were encountered.

The stratigraphy in the two principal basins was similar. In the central area of each of the depressions, deposits exceeded a metre in depth. At the margins of the excavated areas, along the flanks of the ridges which enclosed the basins, deposits ranged from 30 to 50 cm in depth. The stratigraphic profile consisted of an upper zone of approximately 40 cm containing re-deposited colluvial slope wash sediments on which a typical A/B soil profile had developed. These sediments contained evidence of faunaturbation and frost cracks. At a depth ranging between 50 to 60 cm a deposit of Mazama Ash was encountered. Beneath the Mazama Ash and extending to a depth in excess of 125 cm the profile consisted of a series of paleosols (N=4) embedded in a matrix of silty-clay. Basal sediments consisted of till-clay between 100 cm and the base of the excavations, 125 cm.

Six prehistoric components were identified during the excavation.

Component 1: Component 1 contained evidence of shelters and structured activity areas taking the form of congruent concentrations of lithic debitage and faunal material. Hearths were present and a large number of burned or calcined bone was recovered. The component was attributed to a transitional stage between Plains/Mountain and the Mummy Cave complexes and dated directly to 8250 B.P. The assemblage included a Lusk point, a Salmon River Side Notched point, a stemmed atlatl, four point fragments, three bifaces including a large well made bi-pointed biface, an end scraper, retouched or utilized spall tools, core/chopper tools, unifacial tools, retouched flakes, a possible grinder and 448 debitage specimens.

Component 2: Component 2 contained possible evidence of shelters and structured activity areas taking the form of indivudial concentration of lithics and faunal material. Hearths were notably absent, and the amount of burned or calcined bone was low. Component 2 lies in association with a paleosol beneath the Mazama Ash and was dated directly by radiocarbon assay to 7030 and 6820 B.P. The component lacks diagnostic projectile points but is attributed to an Early Mummy Cave complex. The assemblage contained bifaces, scrapers, spall tools, a core/chopper, retouched flakes, and 339 debitage specimens.

Component 3: Component 3 lies immediately beneath the Mazama Ash deposit in association with a paleosol. Evidence of structures was present along with evidence for patterned activities. These are not, however, clearly expressed in the artifact distribution. Hearths are absent. The component is attributed to the Early Mummy Cave Complex. The age of the component was bracketed by dates on Component 2 and the known age of the Mazama Ash. The assemblage contained a projectile point tip, bifaces, a side scraper, a large number of spall tools, core/choppers, a relatively large number of retouched flakes (N=26), a hammerstone and 360 debitage specimens.

Component 4: Component 4 lies immediately above the Mazama Ash deposit. Evidence of structures was lacking. Evidence of activity areas was limited to separate concentrations of lithic and faunal materials. The component is attributed to Mummy Cave/Bitterroot on the basis of its stratigraphic position vis-a-vis the Mazama Ash. The component is poorly dated. A basal date is provided by the Mazama Ash. The age is bracketed by the occurrence of an overlying Oxbow component believed to be greater than 5000 years B.P. The assemblage contained two Bitterroot side notched points, bifaces, a scraper, wedges, a large number of spall tools and a moderate number of retouched flakes. In addition, 723 debitage specimens were recovered.

Component 5: Component 5 lies in the upper colluvial sediments in both basins. The West Basin produced clear evidence for the presence of stone features including a possible stone circle. The East Basin produced a short arcuate alignment of stones which could perhaps be interpreted as part of a shelter. Evidence for structured activity areas in the form of lithic and faunal concentrations is also present in both basins. In the West Basin, several of the concentrations appear to be associated with the interior of a feature which has been interpreted as a shelter. The component was dated typologically on the basis of the occurrence of seven Oxbow and one Hanna projectile point. the assemblage is believed to date to greater than 3000 years B.P. The assemblage contained Oxbow and Hanna projectile points, bifaces, scrapers, spall tools, cobble/core choppers, wedges, retouched flakes, a hammerstone and 1858 specimens of debitage.

Component 6: Component 6 was located in the uppermost colluvial sediments of the site in both basins. Evidence for the presence of shelters was absent. Evidence for the presence of structured activity areas was, for the most part, also missing from both basins. However, a poorly expressed concentration of material was present in the East Basin. The component was dated typologically and stratigraphically. The typological date is provided by the occurrence of two late Plains Side Notched points demonstrating a Late Prehistoric affiliation. The stratigraphic location of the component suggests a possible association with the surface tipi ring features which lie adjacent to the excavations and on the saddle between the excavations. The assemblage contained Late Plains Side Notched points, bifaces, scrapers, retouched flakes and wedges in addition to 249 debitage specimens.

In terms of subsistence, all of the components identified at Hawkwood contained evidence for light butchering, primarily of

bison. The faunal assemblage was, for the most part, limited to limb elements. In a number of cases, there was a preference expressed for either the left or right side, or front and back limbs of the animal suggesting the dismembering of the high utility elements of the exposed side of the kill in articulation for removal to the campsite for immediate consumption. Evidence suggests marrow extraction was practiced, but overall, it appears that bone grease preparation was not practiced. This suggests that the occupations were of relatively short duration. Conversely, the presence of structures, the relatively large number of artifacts, and evidence for structured activity areas suggest that the occupation was probably greater than a week or so.

Evidence of seasonality was present in only one component; however, it is likely, based on a consideration of bison behavior, that in all cases the Hawkwood site was occupied during the winter/early spring. Circumstantial evidence suggests that the Nose Hill Uplands served as a regular part of the seasonal round rather than as an outpost of a base camp situated in the Bow River Valley.

The overall conclusion of the excavations at the Hawkwood site is that the Nose Hill Uplands served as a regular component of the seasonal round for prehistoric hunters throughout the past 8,000 years, and that the use of this area, the hunting strategies employed, and the mode of living was little affected by the dramatic swings in the climate which are argued to have had considerable influence elsewhere.

In consideration of the above it is strongly recommended that the archaeological resources of the Nose Hill Uplands be flagged for special management consideration. It is recommended that Historical Resources Impact Assessments of undeveloped lands within the morainal areas include a backhoe testing component

specifically designed to locate deeply buried components, particularly those which are representative of cultural periods missing from the archaeological record as conserved from the Hawkwood site. It is further recommended that known McKean, Pelican Lake, Avonlea or Besant prehistoric sites within the uplands area also be flagged for conservation study in order to fill in the gaps of the archaeological record in the Hawkwood site. In the normal course of the historical resource management, it is assumed that larger samples will ultimately be recovered, particularly for those components which, although present in the Hawkwood site, are poorly represented there.

8. POSTSCRIPT

Detailed studies of the lithic debitage at EgPm-179, done as a Master Thesis at the University of Calgary by Stewart (1984 Lithic Debitage and Cultural Variability: Problems in the interpretation of a Prehistoric Palimpsest T.) have further refined the clustering and association of artifacts and activity areas within the site.

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TABLE 1: EgPm-179 ARTIFACT DISTRIBUTION EAST BASIN.

Component Number / Tools and Debitage	TOTAL OF EACH COMPONENT				
	1	3	4	5	6
Tools					
Projectile Points					
Unstemmed-Lusk	1				
Triangular Point Tip		1			
Bitterroot Side Notched			2		
Oxbow				3	
Salmon River Side Notched	1				
Stemmed Triangular	1				
Stemmed Base	1				
Lanceolate Point Fragment	2				
Midsection	1				
Bifaces	3				
Biface Tips	1				
Asymmetrical Ovate			1		
Symmetrical Ovate		2	1	1	
Asymmetrical Lanceolate Ovate					
Asymmetrical Triangular				1	
Fragmentary Asymmetrical Ovate				3	
Tip Fragments, Other Fragments		1	1		
Scrapers					
Side End Scraper			1		
Split Pebble End	1				
Side End Split Pebble		1		1	
Wedges			3	4	
Spall Tools					
Retouched	1	7	5	5	1
Utilized	1		2		
Core/Choppers					
Bifacial	1	2		1	
Unifacial	2	1		3	
Hammerstones				1	
Hammerstones-Ovoid		4			
Retouched Flakes					
Localized	3	5	4	10	2
Patterned	3	1	5	7	1
Grinder	1				
Debitage					
Cores	35	18	16	29	1
Core Fragments	2	6	16	13	3
Primary Decortication Flakes	31	32	41	82	24
Secondary Decortication Flakes	24	23	23	65	10
Secondary Flakes	70	89	211	211	33
Thinning	71	34	82	122	15
Retouch/Resharpened	168	101	272	222	34
Shatter	25	30	32	91	12
Non-Identifiable	22	27	30	27	3
TOTAL	472	385	748	902	139

TABLE 2: EgPm-179 ARTIFACT DISTRIBUTION WEST BASIN.

Component Number / Tools and Debitage	TOTAL OF EACH COMPONENT		
	2	5	6
Tools			
Projectile Points			
Late Prehistoric			2
Hanna		1	
Oxbow		4	
Bifaces		1	
Asymmetrical Ovate	3		2
Tip Fragment			1
Scrapers			
Side End Scraper			1
Side Scraper		1	
Split Pebble	1	5	3
End Scraper	4	2	
Spall Tools			
Retouched		2	
Utilized	1	2	
Core/Choppers			
Bifacial	3	2	
Unifacial	8	3	
Retouched Flakes			
Localized		28	7
Patterned		11	4
Hammerstones	1	2	
Wedges		1	2
Debitage			
Cores	6	14	12
Core Fragments	2	16	5
Primary Decortication Flakes	24	43	17
Secondary Decortication Flakes	44	43	24
Secondary Flakes	77	291	57
Thinning	35	74	18
Retouch/Resharpened	84	210	49
Shatter	38	283	133
Non-Identifiable	29	22	2
TOTAL	360	1061	339

TABLE 3:

EgPm-179 East Basin Component 1 Lithic Distribution.

Lithic Material / Tools and Debitage	* Quartzite			Cryptocrystallines												TOTAL
	Fine	Medium	Coarse	Quartz Crystal	Siltstone	Black Chert	Green Chert	Brown Chert	Grey Chert	Paskapoo Chert	Chalcedony	Limestone	Petrified Wood	Red/Pink Heat Treated Chert		
Projectile Points																
Unstemmed-Lusk															1(red)	1
Side Notched - Salmon River															1(pink)	1
Stemmed Triangular						1										1
Stemmed Base							1									1
Lanceolate Point Fragment		1				1										2
Midsection						1										1
Bifaces	1	2														3
Biface Tips		1														1
Scrapers																
Split Pebble End						1										1
Spall Tools																
Retouched		1														1
Utilized		1														1
Core/Choppers																
Scrapers																
Bifacial									1							1
Unifacial	1	1														2
Retouched Flakes																
Localized					2						1					3
Patterned						1					2					3
Grinder			1													1
Debitage																
Cores	4	21	1	1	4	2		1			1					35
Core Fragments		1										1				2
Primary Decort. Flakes		19	3		7	1		1								31
Secondary Decort. Flakes		4	2		17					1						24
Secondary Flakes	1	44	10		8	2			1	2	2					70
Thinning	1	18	2		35	10		2			3					71
Retouch/Resharp.	2	102	10		20	17	16				1					168
Shatter		15	3	1	2	3					1					25
NID		8	1			6	1		1	4			1			22
TOTAL	10	239	33	2	95	46	18	4	2	7	11	1		2		472

* Microcrystallines

TABLE 4:

EgPm-179 West Basin Component 2 Lithic Distribution

Lithic Material / Tools and Debitage	* Quartzite			Cryptocrystallines									TOTAL
					Pebble Cherts								
	Fine	Medium	Coarse	Siltstone	Black	Green	Brown	Grey	Chalcedony	Petrified Wood	Quartz Crystal	Swan River Chert	
Tools													
Bifaces													
Asymmetrical Ovate		3											3
Scrapers													
End					2					2			4
Split Pebble	1												1
Spall Tools													
Utilized	1												1
Core/Choppers													
Bifacial			3										3
Unifacial	1	7											8
Hammerstones			1										1
Debitage													
Cores	1	1	4										6
Core Fragments		1	1										2
Primary Decort. Flakes	6	7	2	2	4			1		2			24
Secondary Decort. Flakes	20	9	6	2	2			2		3			44
Secondary Flakes	13	18	35	1	1			1		8			77
Thinning Flakes	2	6	15	2	5		1		1	2		1	35
Retouch/Resharp. Flakes	12	9	45	2	10	2		2	1	1			84
Shatter	6	2	20	1	4		1			3	1		38
Non Identifiable Flake Fragment	1	7	3		4			1		13			29
TOTAL	64	70	135	10	32	2	2	7	2	34	1	1	360

* Microcrystallines

TABLE 5:

EgPm-179 East Basin Component 3 Lithic Distribution.

Lithic Material / Tools and Debitage	*			CRYPTOCRYSTALLINE															TOTAL
	Quartzite				Pebble Chert				**		Other Cherts								
	Fine	Medium	Coarse	Siltstone	Black	Green	Brown	Grey	Brown Banded	Grey Banded	South Everson	Avon	Montana	Purcellanite	Petrified Wood	Chalcedony	Yellow Agate		
Tools																			
Projectile Points																			
Triangular Point Tip												1							1
Bifaces																			
Complete																			
Symm. Ovate	2																		2
Tip Fragments																			
Other Fragments				1															1
Scrapers, Side End																			
Split Pebble																1			1
Spall Tools																			
Retouched	2	2	1	2															7
Utilized																			
Core/Choppers																			
Bifacial	1	1																	2
Unifacial			1																1
Retouched Flakes																			
Localized	1		1		1	1										1			5
Patterned				1															1
Hammerstones																			
-Ovoid		1	3																4
Debitage																			
Cores		8	5	3					1					1					18
Core Fragments		1	2	3															6
Primary Decort. Flakes	1	12	11	1	2		2	1	2										32
Secondary Decort. Flakes	2	6	4	6			1		1		2							1	23
Secondary Flakes	5	66	5	2		3		2		2					1	1	2		89
Thinning	6	16	1	9									2						34
Retouch/Resharp	7	62	10	15	5				2										101
Shatter	1	5	4	9	3		2											6	30
NID	3	14	6	1				1										2	27
TOTALS	31	194	54	53	10	4	6	4	6	2	2	1	2	1	1	3	11		385

* Microcrystalline ** Silicious Cherts

TABLE 6:

EgPm-179 East Basin Component 4 Lithic Distribution

Lithic Material / Tools and Debitage	Microcrystall.					Cryptocrystallines										TOTAL
	Quartzite				Sandstone	Quartz Crystal	Siltstone	Pebble Chert				Other Chert				
	Fine	Medium	Coarse	Beaver Creek				Black	Green	Brown	Grey	Etherington	Avon	Chalcedony	Ignimbrite	
Tools																
Points																
Bitterroot Side-Notched		1							1							2
Bifaces																
Complete																
Asymm. Lanceolate	1															1
Sym. Ovate	1															1
Fragmentary Tip	1															1
Scrapers																
Side End	1															1
Wedges		2												1		3
Spall Tools																
Retouched	2	1	2													5
Utilized	1		1													2
Retouched Flakes																
Localized		1					1				2					4
Patterned	4								1							5
Debitage																
Cores	1	8	2				2				3					16
Core Fragments	3	6	1	1		1	1				2	1				16
Primary Decort. Flakes	6	12	8		1		8	4		1	1					41
Secondary Decort Flakes	2	11	1				8				1					23
Secondary	23	145	15				9	3	1		14				1	211
Thinning	33	24	1				15	1			7	1				82
Retouch/Resharp.	105	88	6				31		5		26		11			272
Shatter	6	6	8				3				9					32
NID	9	6	2		1		5		1		5			1		30
TOTAL	199	311	47	1	2	1	83	8	9	1	70	2	11	2	1	748

TABLE 7:

EgPm-179 East Basin Component 5 Lithic Distribution

Lithic Material / Tools and Debitage	Microcryst.				Cryptocrystallines									
	Quartzite			Sandstone	Siltstone	Pebble Cherts				Red Heat Treated Chert	Swan River Chert	Chalcedony	Petrified Wood	TOTAL
	Fine	Medium	Coarse			Black	Green	Brown	Grey					
Tools														
Projectile Points														
Oxbow		1				2								3
Bifaces														
Complete														
Asymmetrical														
Triangular									1					1
Symmetrical Ovate		1												1
Fragmentary														
Asymmetrical Ovate	2				1									3
Scrapers														
Side End Split Pebble			1											1
Spall Tools														
Retouched	3	1	1											5
Core/Choppers														
Bifacial		1												1
Unifacial		3												3
Retouched Flakes														
Localized	3	3	1		3									10
Patterned	5						1				1			7
Hammerstones			1											1
Wedges							1		1			2		4
Debitage														
Cores	1	13	10		5									29
Core Fragments		4			5	1	1		2					13
Primary Decort. Flake	3	23	35	1	10	3			6	1				82
Secondary Decort. Flakes	12	23	14		10	3	1		2					65
Secondary	24	105	46		24	3		1	8					211
Thinning	39	53	15		9	2			4					122
Retouch/Resharp.	67	70	30		19	9	1	3	22				1	222
Shatter	6	33	29		10		1		10	1			1	91
NID	3	2	1		1					1			1	27
TOTAL	168	354	194	1	97	23	6	4	56	3	1	2	3	902

TABLE 8:

EgPm-179 West Basin Component 5 Lithic Distribution

Lithic Material / Tools and Debitage	*			Cryptocrystallines								TOTAL
	Quartzite				Pebble Cherts							
	Fine	Medium	Coarse	Siltstone	Black	Green	Brown	Grey	Chalcedony	Petrified Wood	Vein Quartz	
Projectile Points												
Hanna					1							1
Oxbow						3		1				4
Bifaces		1										1
Scrapers												
End	1	1										2
Side										1		1
Split Pebble				1	2	1		1				5
Spall Tools												
Retouched		2										2
Utilized	2											2
Core/Choppers												
Bifacial	1	1										2
Unifacial			3									3
Retouched Flakes												
Localized	4	6		5	4	2		1	4	2		28
Patterned	3	2		1		1	1	1	1	1		11
Hammerstones		1	1									2
Wedges						1						1
Debitage												
Cores	3	2	8		1							14
Core Fragments	4	7	3		1						1	16
Primary Decort. Flakes	8	12	8	1	5	2		6		1		43
Secondary Decort. Flake	12	20	6		2			2			1	43
Secondary Flakes	36	176	69	4	2		1	2		1		291
Thinning Flakes	27	29	9	3	2		1	1	1		1	74
Retouch/Resharp Flakes	56	97	33	2	5	1	1		13	1	1	210
Shatter	26	114	110	2	3			6		2	20	283
Non Identifiable Flake Fragments	1	10	5							6		22
TOTALS	184	481	255	19	28	11	4	21	19	15	24	1051

* Microcrystallines

TABLE 9:

EgPm-179 East Basin Component 6 Lithic Distribution

Lithic Material / Tools and Debitage	Microcrystal				Cryptocrystallines								TOTAL
	Quartzite					Pebble cherts							
	Fine	Medium	Coarse	Sandstone	Siltstone	Black	Green	Brown	Grey	White	Heat Treated Chert	Chalcedony	
Spall Tools Retouched		1											1
Retouched Flakes Localized					2								2
Patterned	1												1
Debitage Cores	1												1
Core Fragments		2			1								3
Primary Decort. Flakes	3	7	8	2	2	1		1					24
Secondary Decort. Flakes	2	2	3		3								10
Secondary	3	16	9		5								33
Thinning	3	8			3	1							15
Retouch/Resharp.	6	16	1		4				3	2	1	1	34
Shatter	3	3	4	1					1				12
NID		1	1		1								3
TOTAL	22	56	26	3	21	2	1	1	4	2	1	1	139

TABLE 10:

EgPm-179 West Basin Component 6 Lithic Distribution

Lithic Material / Tools and Debitage	Microcrystal			Cryptocrystallines								
	Quartzite			Pebble Cherts								
	Fine	Medium	Coarse	Siltstone	Black	Green	Brown	Grey	Chalcedony	Petrified Wood	Montana Chert	TOTAL
Projectile Points												
Late Prehistoric	1										1	2
Bifaces												
Assymetrical Ovate	1				1							3
Tip Fragment	1											
Scrapers												
Side End	1											
Split Pebble	1				2							4
Spall Tools												
Retouched												
Utilized												
Core/Choppers												
Bifacial												
Unifacial												
Retouched Flakes												
Localized	3	2	1		1							7
Patterned	1		2							1		4
Hammerstones												
Wedges	1				1							2
Debitage												
Cores	1	5	5		1							12
Core Fragments	2		2		1							5
Primary Decort. Flakes	8	3	3		2			1				17
Second. Decort. Flakes	8	9	6		1							24
Secondary Flakes	3	36	17					1				57
Thinning Flakes	9	4	2		3							18
Retouch/Resharp Flakes	21	13	9	1	1	1		1	1	1		49
Shatter	18	64	45	3	1				1	1		133
Non Identifiable Plate Fragments										2		2
TOTAL	80	136	92	4	15	1		3	2	5	1	339

TABLE 11:

EgPm-179 Eastern Test Units Lithic Distribution

Debitage \ Lithic Material	Fine	Medium	Coarse	Grey Siltstone	Black Chert	Grey	TOTAL
Cores		1	1				2
Core Fragments							
Primary Decortication	1		1	2	2	1	7
Secondary Decortication	1	1	2		1		5
Primary		1	1				2
Secondary	1	4		2	1		8
Thinning	1		1		1		3
Retouch	4				3		7
NID							
Shatter	2						2
TOTAL	10	7	6	4	8	1	36

TABLE 12:

EgPm-179 Western Test Units Lithic Distribution

Tools and Debitage \ Lithic Material	* Fine	Medium	Coarse	Siltstone	Black	Green	Brown	Grey	Chalcedony	Petrified wood	TOTAL
Tools											
End Scraper							1				1
Core/Choppers Bifacial	2										2
Retouched Flakes											
Localized		2									2
Patterned	1				1						2
Debitage											
Cores			1								1
Core Fragments	1										1
Primary Decort.	1	2	3								6
Secondary Decort.	1	5		1							7
Secondary	3	12	6								21
Thinning	10	3		1							14
Retouch and Resharp.	12	1	2								15
Shatter	5	5	1								11
NID	9	1	1								11
TOTAL	45	31	14	2	1	1					94

* Microcrystallines

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Table 13: Species Distribution

Component	Bison	Deer	Elk	Moose	Dog	Fox	Rodent
6	2						
5	3			1		1	
4	2		1				
3	1				1		1
2	2	1					
1	1						

EgPm-179

Table 14: Bison Distribution: Counts/Weights

	Component 1		Component 2		Component 3		Component 4		Component 5		Component 6	
	#	wt.	#	wt.	#	wt.	#	wt.	#	wt.	#	wt.
Fragments	1479	840.6	215	180.7	55	115.4	76	283.9	35	76.8	6	16.6
Burned Fragments	731	442.7	176	132.2	5	4.3	2	1.5	4	1.9		
Calcined Fragments	146	86.1	12	9.1	3	2.9	4	4.5			1	1.7
Tooth Fragments	38	20.2	6	3.6	10	31.9	20	73.8	18	273.8	1	1.2
Identifiable Bison	12	234.3	4	431.7	16	321.5	13	302.6	5	148.3	11	419.7
Identifiable Non-Bison			4	13.6	18	5.1	1	23.2	9	112.9		

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Table 15: Non-Bison Element Distribution

Species/ Element	Deer		Elk	Moose		Dog	Fox
	Antler Tine	Vertebra	First Phalanxes	Scapula	Humerus	First Phalanxes	Teeth/Mandible Molar
6							
5				1	1		
4			1				
3						1	1
2	1	1					
1							

TABLE: 16 EgPm-179 AREA , OCCUPATION 1 , BUTCHERING UNIT COUNT 1 Individual

ELEMENT	No. of Elements			See Below			Butchering Units																			
	L	Ax/ Ind	R	A	B	C	1	2	3	4	5	6	8	9	10	11	14	15	16	19	20	31	34	35	43	
Skull																										
Mandible																										
Hyoid																										
Atlas																										
Axis																										
Cervical Vertebrae																										
Thoracic Vertebrae																										
Lumbar Vertebrae																										
Sacrum																										
Caudal Vertebrae																										
Rib																										
Sternebrae																										
Scapula																										
Humerus		1	1	2	50	1																		1	1	
Radius																										
Ulna																										
Magnum																										
Scaphoid																										
Lunate																										
Unciform																										
Cuneiform																										
Pisiform																										
Metacarpal																										
5th Metacarpal																										
Pelvis																										
Femur		1		2	50	1								3	1											
Tibia																										
Patella																										
Lat. Malleolus																										
1st Tarsal																										
Astragulus																										
Calcaneum	1			2	50	1	1																			
Navic. Cuboid																										
Cuneiform Pes																										
Metatarsal	1			2	50	1									1											
2nd Metatarsal																										
P1			1	a	12.5	1	1																			
P2	1		2	8	37.5	3	2			1																
P3																										
Distal Sesamoid																										
Proximal Sesamoid																										

A. Potential frequency of element (Minimum number of animals in occupation x number of elements per animal).

B. Percentage frequency of element representation (actual element frequency/potential element frequency.

C. Minimum number of elements represented by Butchering Units.

TABLE 17: EgPm-179 Component 1 Element Frequency Chart (minimum: 1 bison)

EgPm-179

TABLE: 18 AREA , OCCUPATION 2 , BUTCHERING UNIT COUNT 2 Individuals

ELEMENT	No. of Elements			See Below			Butchering Units																			
	L	Ax/ Ind	R	A	B	C	1	2	3	4	5	6	8	9	10	11	14	15	16	19	20	31	34	35	43	
Skull																										
Mandible																										
Hyoid																										
Atlas																										
Axis																										
Cervical Vertebrae																										
Thoracic Vertebrae																										
Lumbar Vertebrae																										
Sacrum																										
Caudal Vertebrae																										
Rib																										
Sternebrae																										
Scapula																										
Humerus																										
Radius																										
Ulna																										
Magnum																										
Scaphoid																										
Lunate																										
Unciform																										
Cuneiform																										
Pisiform																										
Metacarpal																										
5th Metacarpal																										
Pelvis																										
Femur																										
Tibia			1	4	25	1									1											
Patella																										
Lat. Malleolus																										
1st Tarsal																										
Astragulus			2	4	50	2		1										1								
Calcaneum			1	4	25	1										1										
Navic. Cuboid																										
Cuneiform Pes																										
Metatarsal																										
2nd Metatarsal																										
P1																										
P2																										
P3																										
Distal Sesamoid																										
Proximal Sesamoid																										

A. Potential frequency of element (Minimum number of animals in occupation x number of elements per animal).

B. Percentage frequency of element representation (actual element frequency/potential element frequency.

C. Minimum number of elements represented by Butchering Units.

TABLE 19: EgPm-179 Component 2 Element Frequency Chart (minimum: 2 bison)

EgPm-179

TABLE: 20 AREA , OCCUPATION 3 , BUTCHERING UNIT COUNT 1 Individual

ELEMENT	No. of Elements			See Below			Butchering Units																		
	L	Ax/ Ind	R	A	B	C	1	2	3	4	5	6	8	9	10	11	14	15	16	19	20	31	34	35	43
Skull																									
Mandible																									
Hyoid																									
Atlas		1		1	100	1																			
Axis																									
Cervical Vertebrae		1		5	20	1																			
Thoracic Vertebrae																									
Lumbar Vertebrae																									
Sacrum																									
Caudal Vertebrae																									
Rib																									
Sternebrae																									
Scapula																									
Humerus																									
Radius																									
Ulna	1			2	50	1														1					
Magnum																									
Scaphoid																									
Lunate																									
Unciform																									
Cuneiform																									
Pisiform																									
Metacarpal																									
5th Metacarpal																									
Pelvis																									
Femur	1		1	2	100	2									2										
Tibia	1		1	2	100	2				0	1												1		
Patella																									
Lat. Malleolus																									
1st Tarsal																									
Astragulus			1	2	50	1	1																		
Calcaneum																									
Navic. Cuboid	1			2	50	1											1								
Cuneiform Pes	1		1	2	100	2	2																		
Metatarsal		1		2	50	1					1														
2nd Metatarsal																									
P1																									
P2	1			8	12.5	1	1																		
P3																									
Distal Sesamoid																									
Proximal Sesamoid																									

A. Potential frequency of element (Minimum number of animals in occupation x number of elements per animal).

B. Percentage frequency of element representation (actual element frequency/potential element frequency.

C. Minimum number of elements represented by Butchering Units.

TABLE 21: EgPm-179 Component 3 Element Frequency Chart (minimum: 1 bison)

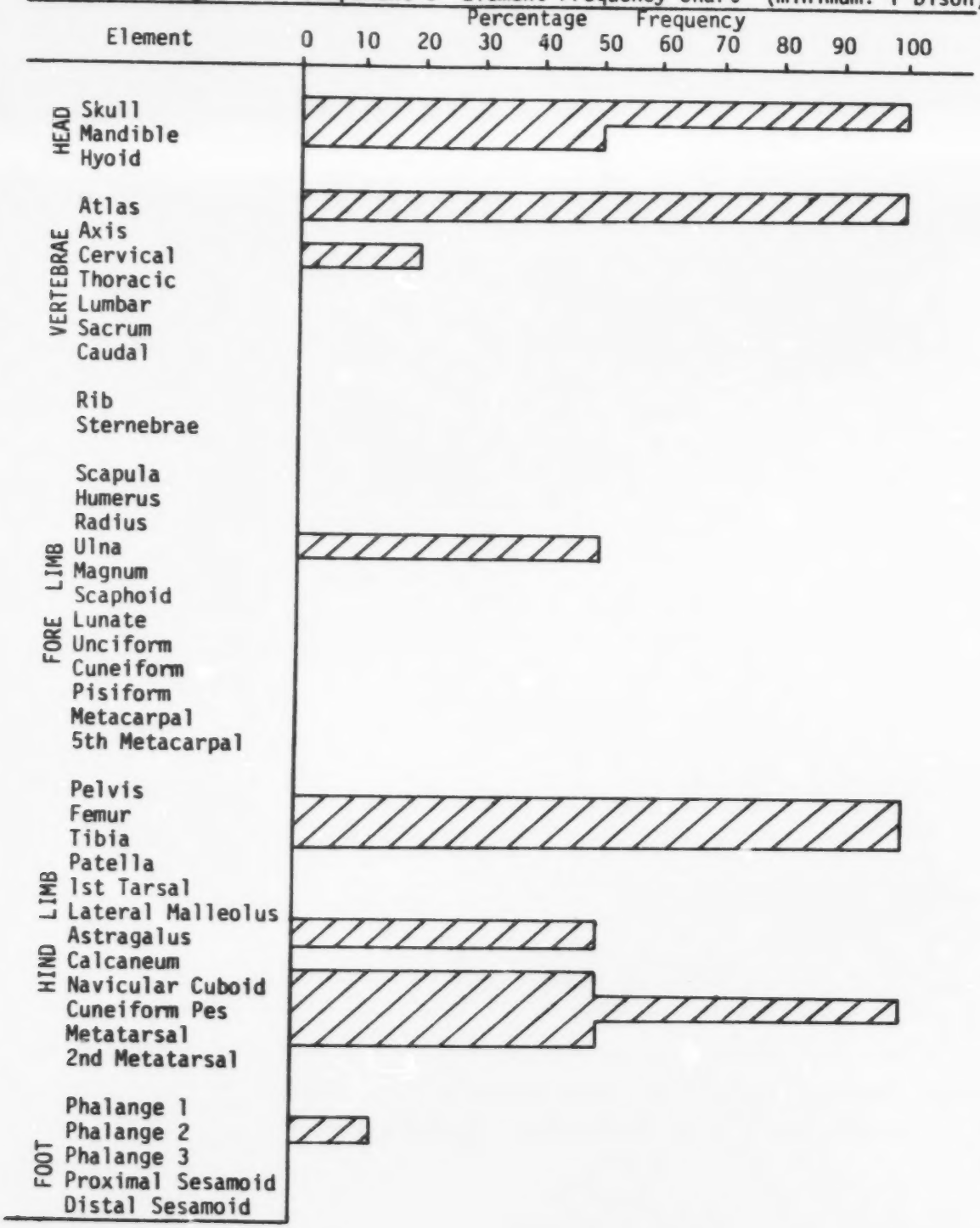


TABLE: 22 EgPm-179 AREA , OCCUPATION 4 , BUTCHERING UNIT COUNT 2 Individuals

ELEMENT	No. of Elements			See Below			Butchering Units																		
	L	Ax/ Ind	R	A	B	C	1	2	3	4	5	6	8	9	10	11	14	15	16	19	20	31	34	35	43
Skull																									
Mandible																									
Hyoid																									
Atlas																									
Axis																									
Cervical Vertebrae																									
Thoracic Vertebrae																									
Lumbar Vertebrae																									
Sacrum																									
Caudal Vertebrae																									
Rib																									
Sternebrae																									
Scapula																									
Humerus	1			4	25	1		1											1						
Radius																									
Ulna																									
Magnum																									
Scaphoid																									
Lunate																									
Unciform																									
Cuneiform																									
Pisiform																									
Metacarpal			1	4	25	1			1																
5th Metacarpal																									
Pelvis																									
Femur																									
Tibia			1	4	25	1													1						
Patella																									
Lat. Malleolus																									
1st Tarsal																									
Astragulus			1	4	25	1							1	1											
Calcaneum			1	4	25	1						1						1							
Navic. Cuboid																									
Cuneiform Pes	1			4	25	1		1																	
Metatarsal																									
2nd Metatarsal																									
P1																									
P2																									
P3																									
Distal Sesamoid																									
Proximal Sesamoid																									

A. Potential frequency of element (Minimum number of animals in occupation x number of elements per animal).

B. Percentage frequency of element representation (actual element frequency/potential element frequency.

C. Minimum number of elements represented by Butchering Units.

TABLE 23: EgPm-179 Component 4 Element Frequency Chart (minimum: 2 bison)

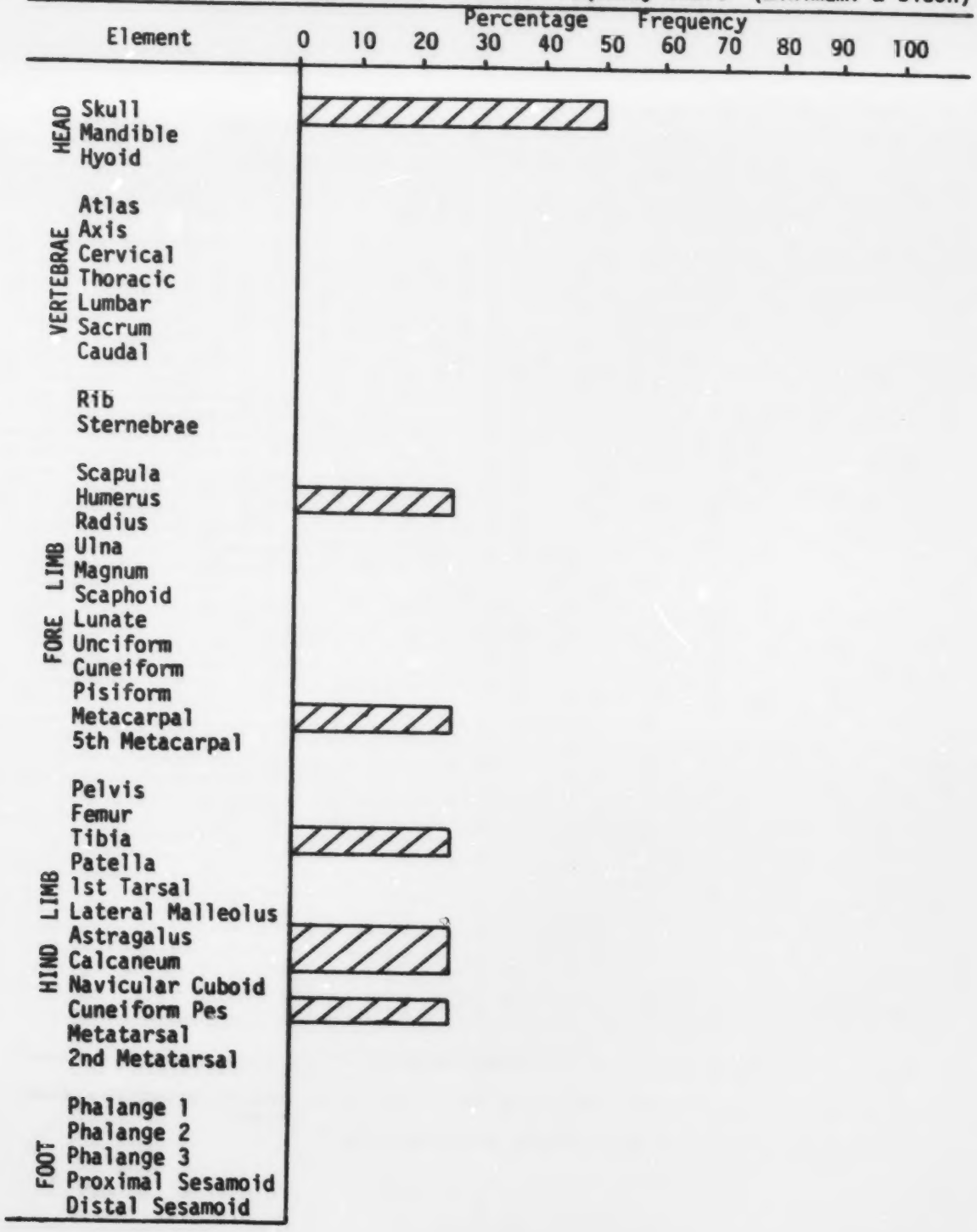


TABLE: 24 EgPm-179 AREA , OCCUPATION 5 , BUTCHERING UNIT COUNT 3 Individuals

ELEMENT	No. of Elements L	Ax/ Ind	R	See Below A	B	C	Butchering Units 1	2	3	4	5	6	8	9	10	11	14	15	16	19	20	31	34	35	43
Skull																									
Mandible																									
Hyoid																									
Atlas																									
Axis																									
Cervical Vertebrae																									
Thoracic Vertebrae																									
Lumbar Vertebrae																									
Sacrum																									
Caudal Vertebrae																									
Rib																									
Sternebrae																									
Scapula																									
Humerus																									
Radius																									
Ulna																									
Magnum																									
Scaphoid																									
Lunate																									
Unciform																									
Cuneiform																									
Pisiform																									
Metacarpal																									
5th Metacarpal																									
Pelvis																									
Femur																									
Tibia	1			6	16.7	1				1															
Patella																									
Lat. Malleolus																									
1st Tarsal																									
Astragulus																									
Calcaneum																									
Navic. Cuboid	1			6	16.7	1						1													
Cuneiform Pes																									
Metatarsal	1			6	16.7	1					1														
2nd Metatarsal																									
P1	2			24	8.3	2	2																		
P2																									
P3																									
Distal Sesamoid																									
Proximal Sesamoid																									

A. Potential frequency of element (Minimum number of animals in occupation x number of elements per animal).

B. Percentage frequency of element representation (actual element frequency/potential element frequency.

C. Minimum number of elements represented by Butchering Units.

TABLE 25: EgPm-179 Component 5 Element Frequency Chart (minimum: 3 bison)

TABLE: 26 AREA EgPm-179, OCCUPATION 6, BUTCHERING UNIT COUNT 2 Individuals

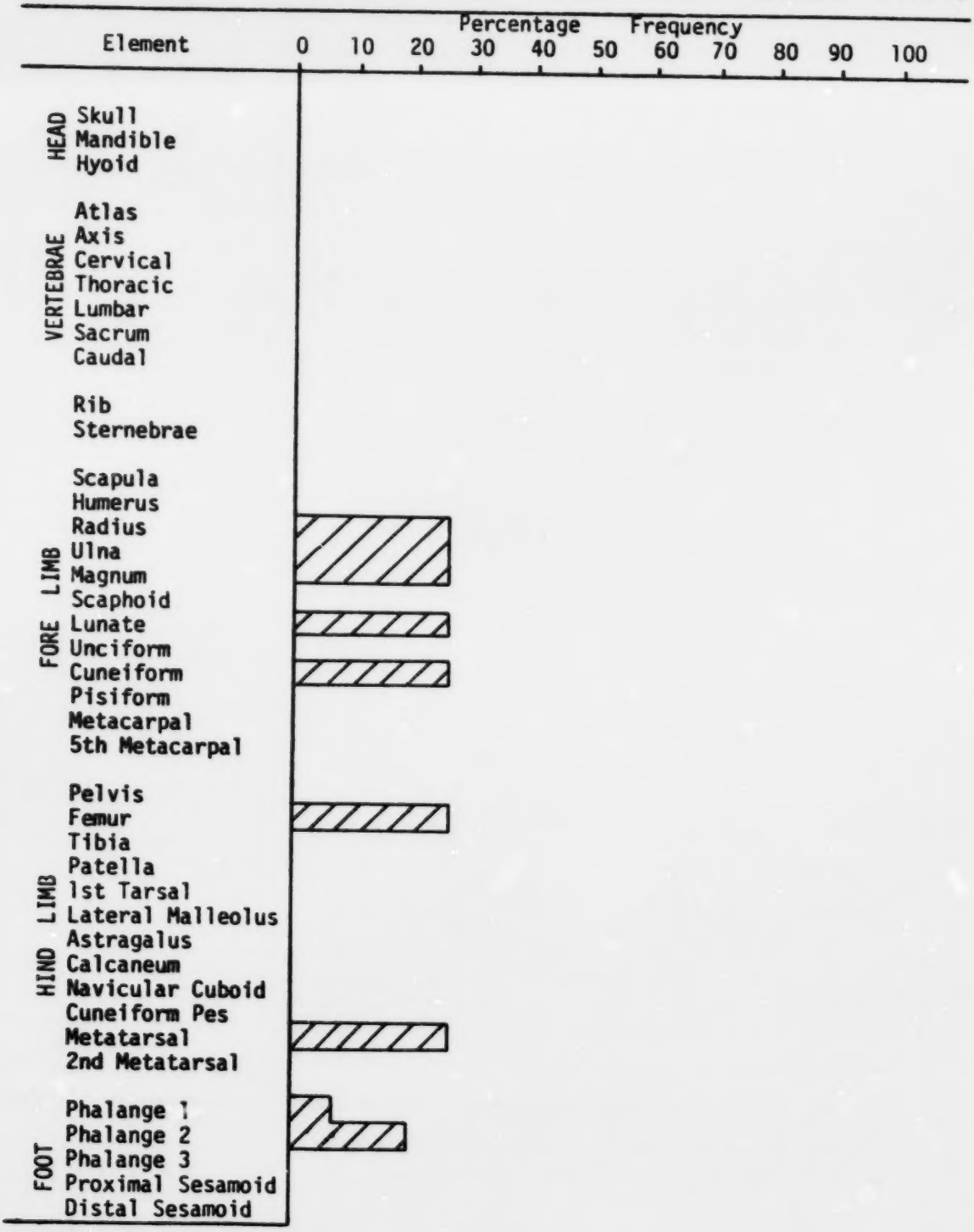
ELEMENT	No. of Elements			See Below			Butchering Units																		
	L	Ax/ Ind	R	A	B	C	1	2	3	4	5	6	8	9	10	11	14	15	16	19	20	31	34	35	43
Skull																									
Mandible																									
Hyoid																									
Atlas																									
Axis																									
Cervical Vertebrae																									
Thoracic Vertebrae																									
Lumbar Vertebrae																									
Sacrum																									
Caudal Vertebrae																									
Rib																									
Sternebrae																									
Scapula																									
Humerus																									
Radius	1			4	25	1										1									
Ulna	1			4	25	1			1																
Magnum	1			4	25	1	1																		
Scaphoid																									
Lunate	1			4	25	1	1																		
Unciform																									
Cuneiform	1			4	25	1	1																		
Pisiform																									
Metacarpal																									
5th Metacarpal																									
Pelvis																									
Femur	1			4	25	1																1			
Tibia																									
Patella																									
Lat. Malleolus																									
1st Tarsal																									
Astragulus																									
Calcaneum																									
Navic. Cuboid																									
Cuneiform Pes																									
Metatarsal			1	4	25	1				1															
2nd Metatarsal																									
P1			1	16	6.25	1															1				
P2	1	1	1	16	18.75	3	1																		
P3																									
Distal Sesamoid																									
Proximal Sesamoid																									

A. Potential frequency of element (Minimum number of animals in occupation x number of elements per animal).

B. Percentage frequency of element representation (actual element frequency/potential element frequency.

C. Minimum number of elements represented by Butchering Units.

TABLE 27 EgPm-179 Component 6 Element Frequency Chart (minimum: 2 bison)



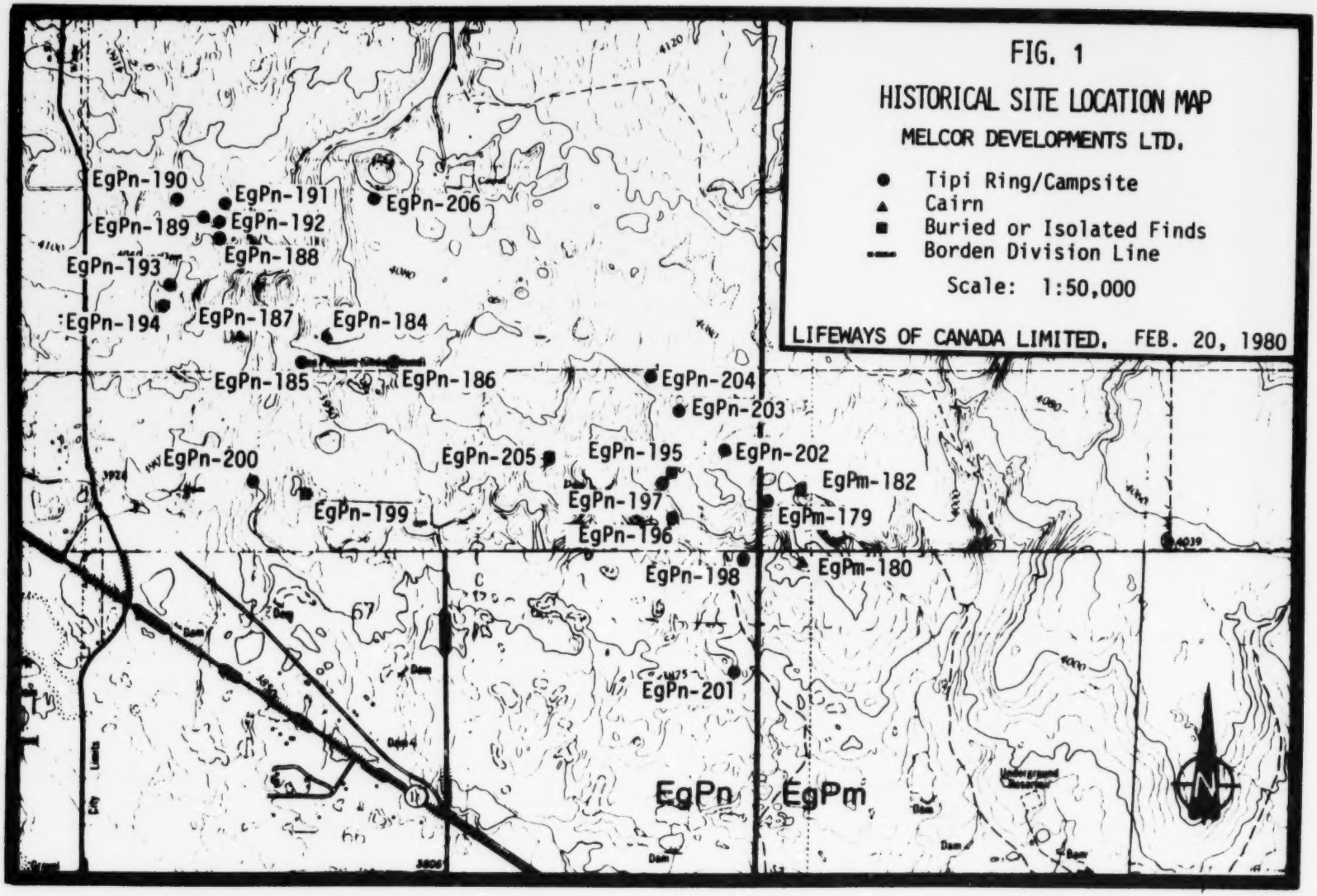


FIG. 1
HISTORICAL SITE LOCATION MAP
MELCOR DEVELOPMENTS LTD.
Tipi Ring/Campsite
Cairn
Buried or Isolated Finds
Borden Division Line
Scale: 1:50,000
LIFEWAYS OF CANADA LIMITED. FEB. 20, 1980
EgPn-190
EgPn-191
EgPn-206
EgPn-189
EgPn-192
EgPn-188
EgPn-193
EgPn-194
EgPn-187
EgPn-184
EgPn-185
EgPn-186
EgPn-204
EgPn-203
EgPn-200
EgPn-205
EgPn-195
EgPn-202
EgPm-182
EgPn-197
EgPn-199
EgPm-179
EgPn-196
EgPn-198
EgPm-180
EgPn-201
EgPn
EgPm
N

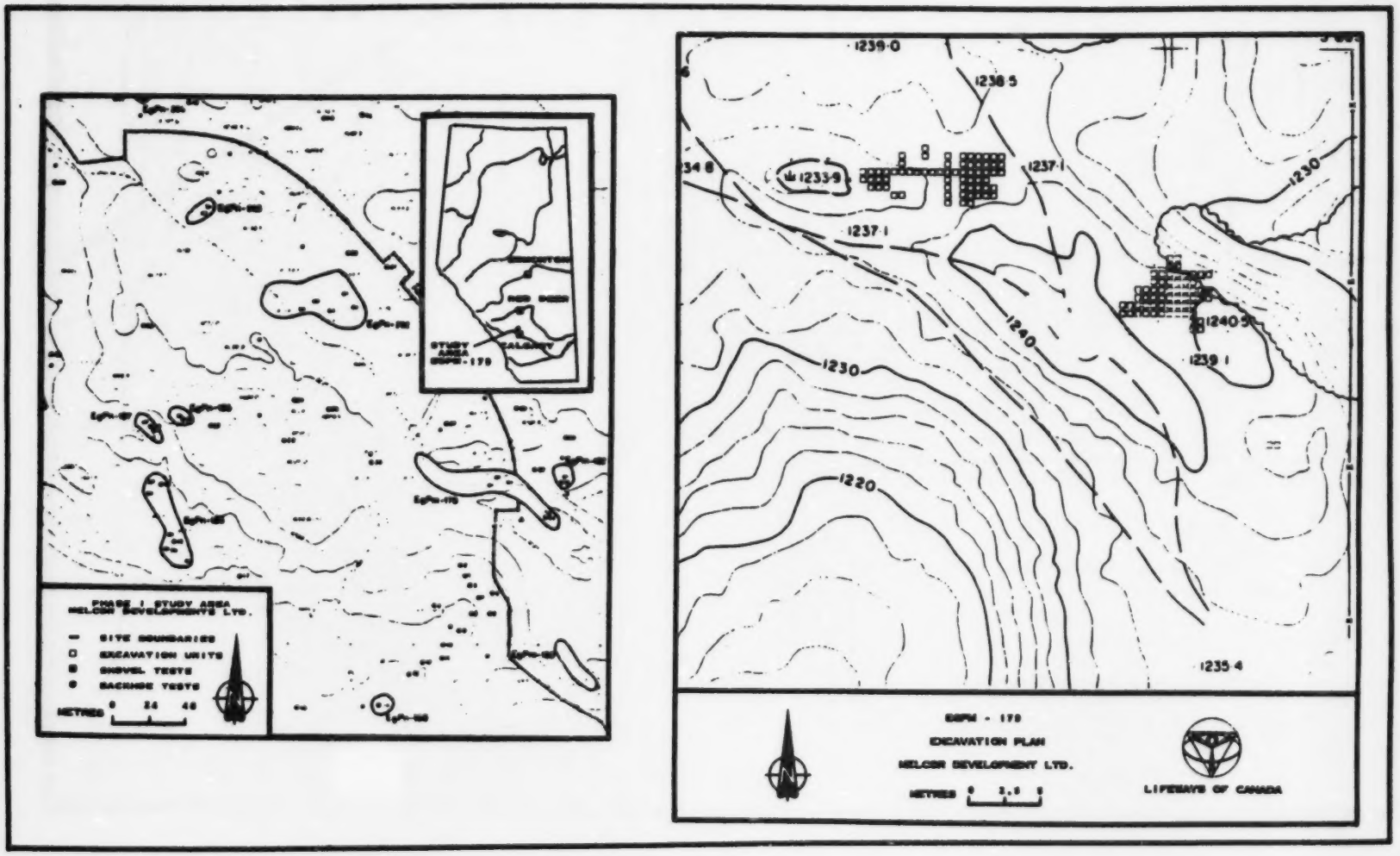


FIGURE 2. SITE AREA MAP.

FIGURE 3: EXCAVATION PLAN

EgPn-179 Melcor, East Basin

Scale 1:100

Position of excavation unit on-site.

Position of excavation unit on artifact distribution figures.

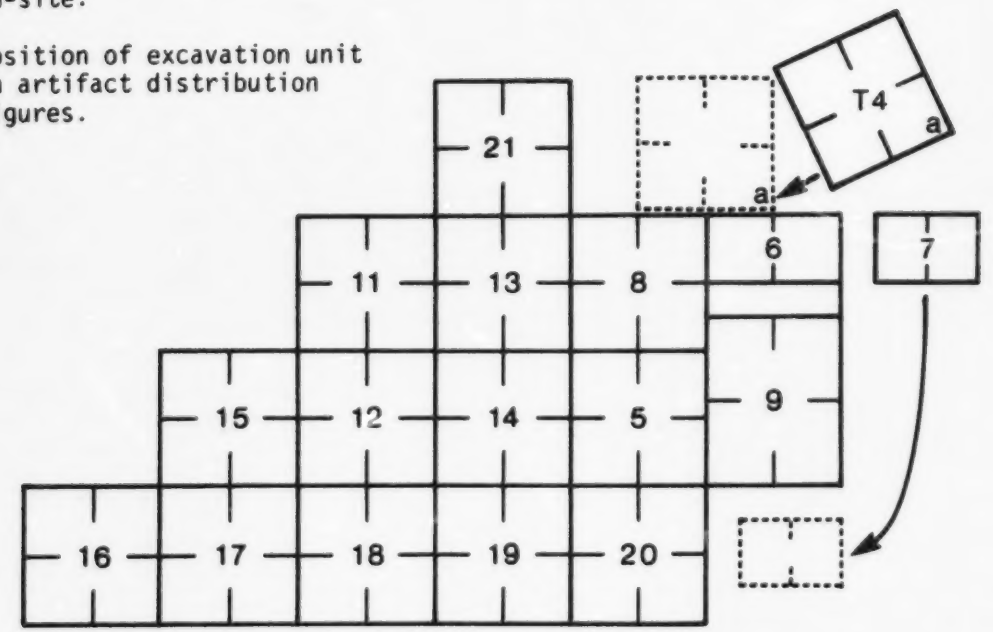
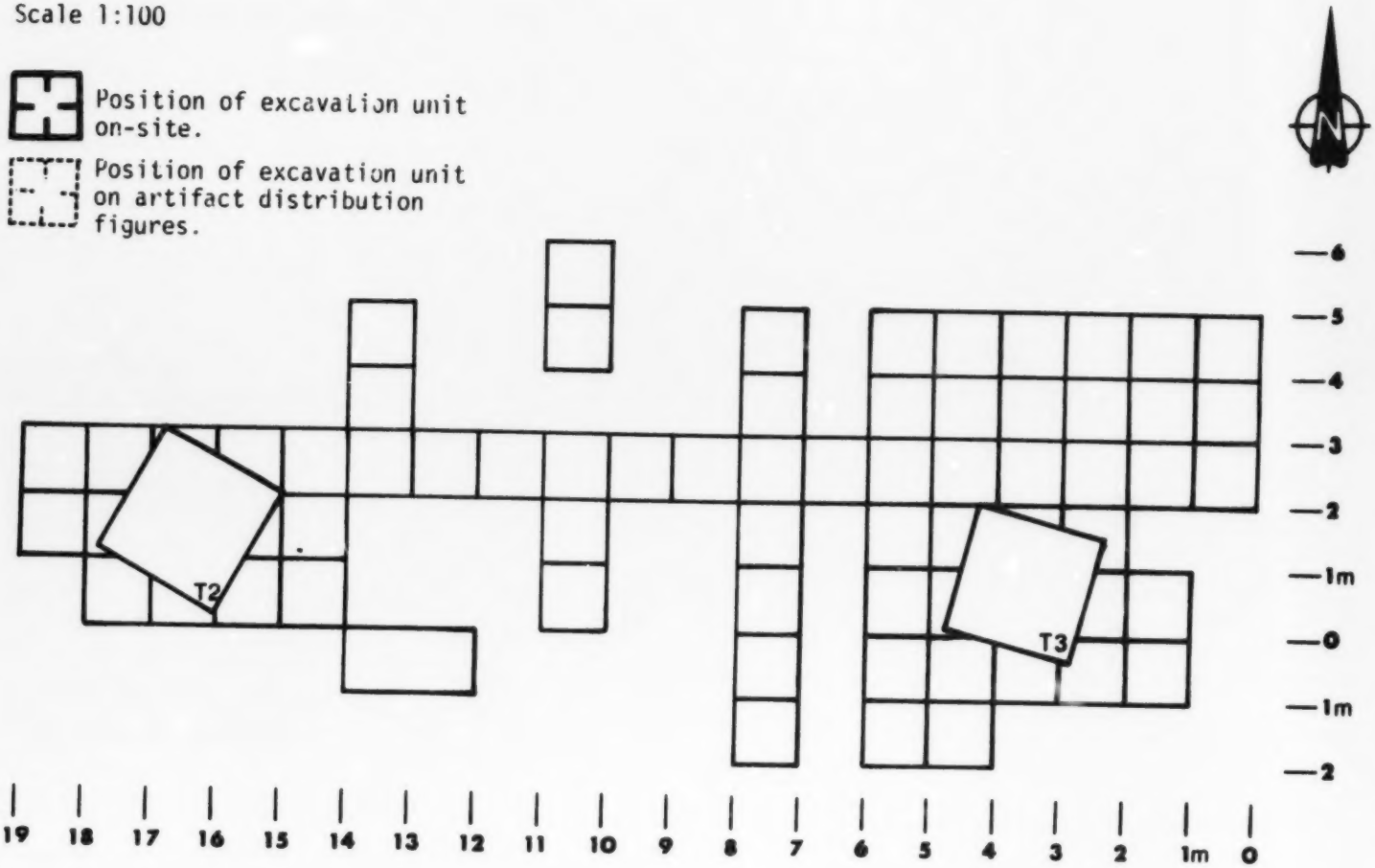


FIGURE 4: EXCAVATION PLAN

EgPn-179 Melcor, West Basin

Scale 1:100



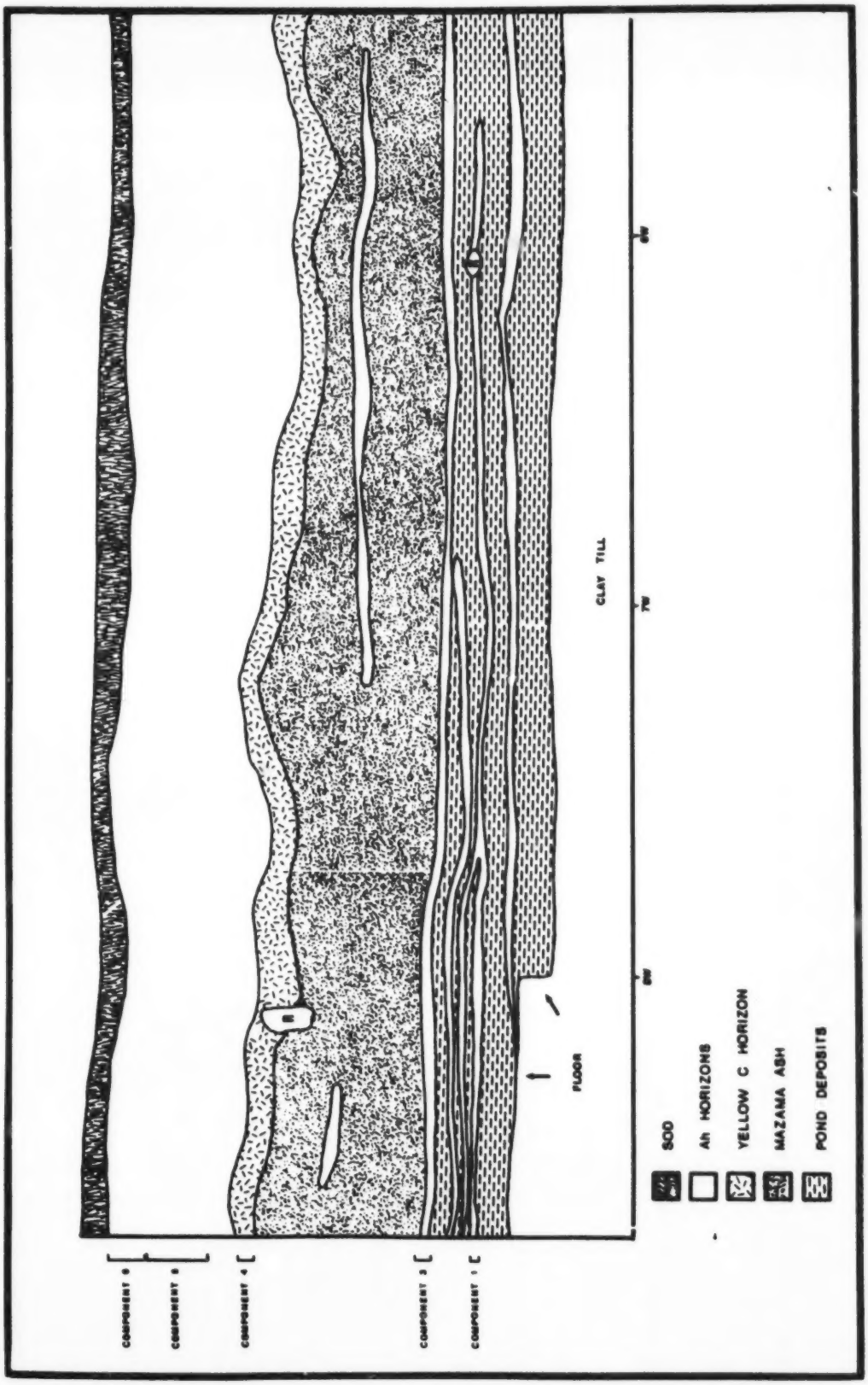


FIGURE 5. EAST BASIN PROFILE, NORTH WALL CENTRAL PORTION OF BASIN.

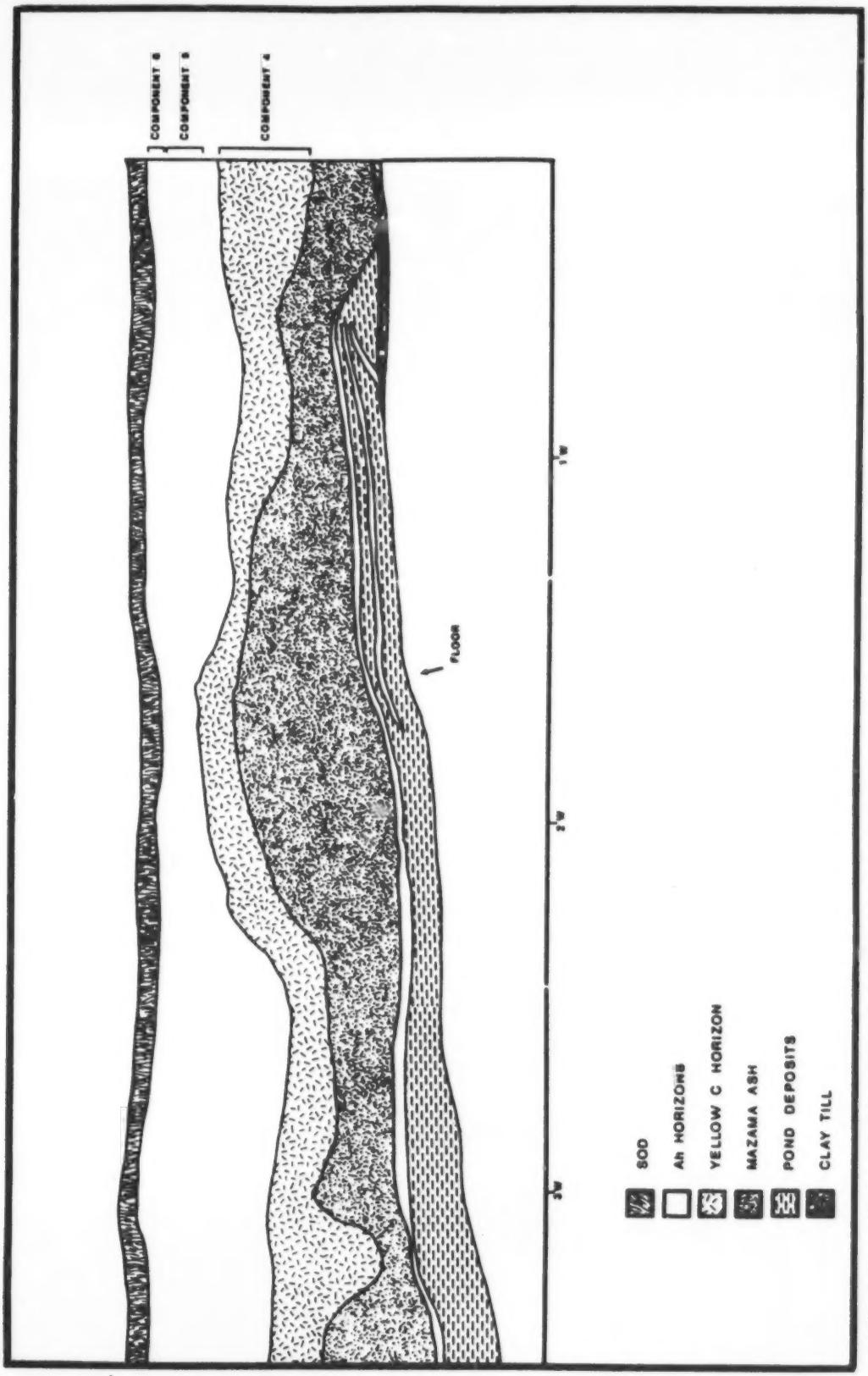


FIGURE 6. EAST BASIN PROFILE, NORTH WALL EASTERN MARGIN OF BASIN.

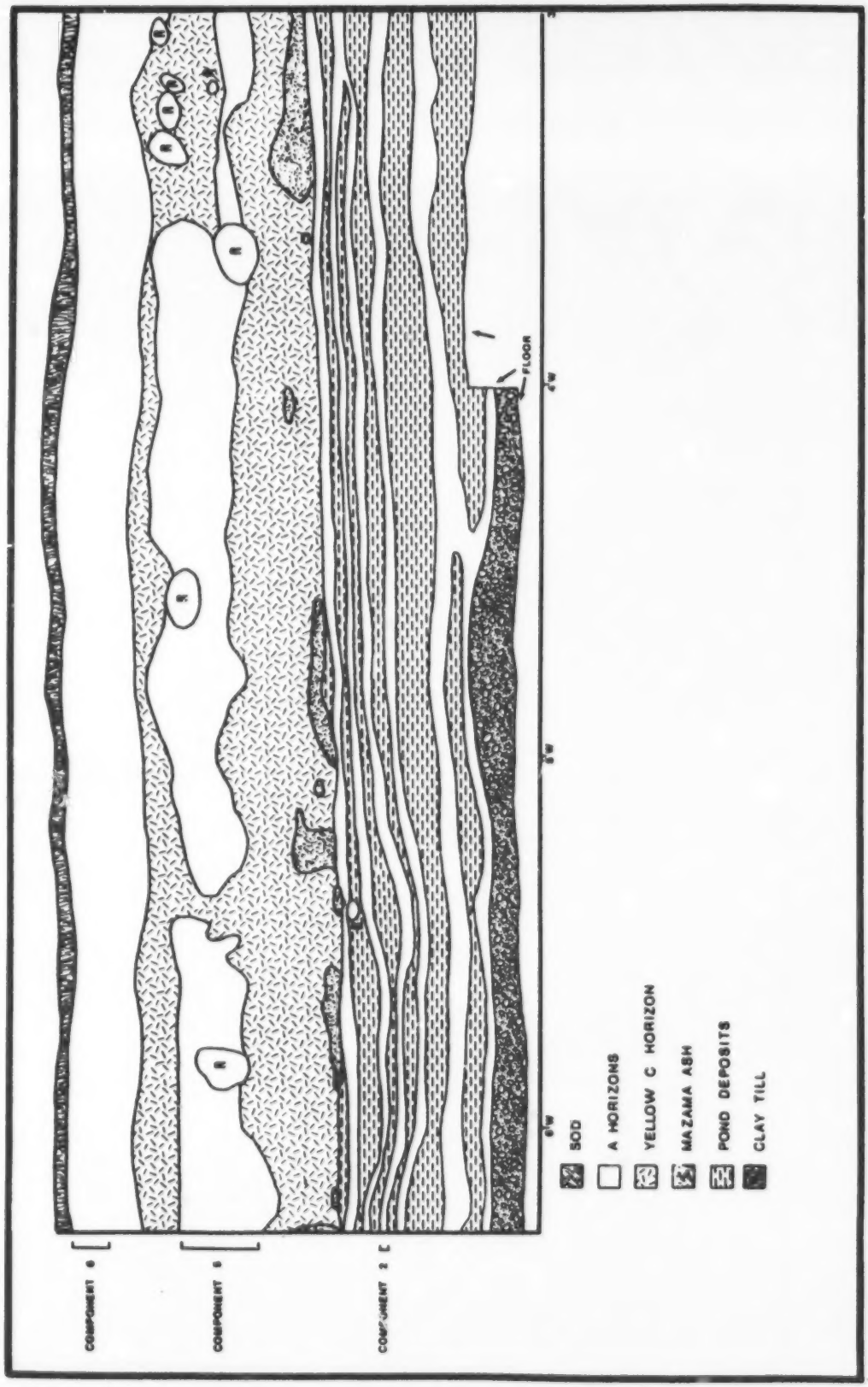


FIGURE 7. WEST BASIN PROFILE, NORTH WALL CENTRAL PORTION OF BASIN.

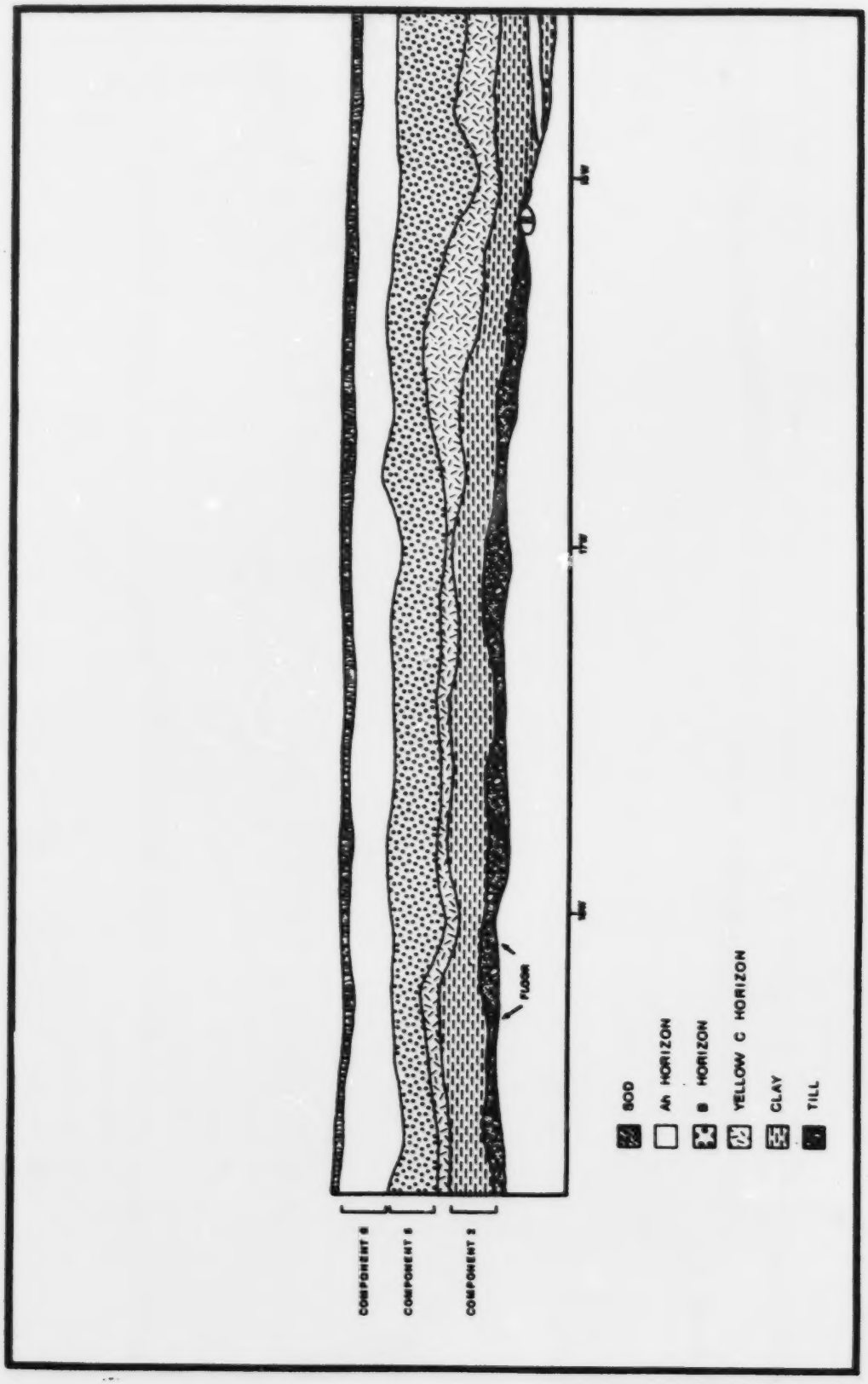


FIGURE 8. WEST BASIN PROFILE, NORTH WALL WESTERN MARGIN OF BASIN.

FIGURE 9:
STONE FEATURE DISTRIBUTION
Melcor, East Basin, Component 1
Scale 1:100

● Cobble

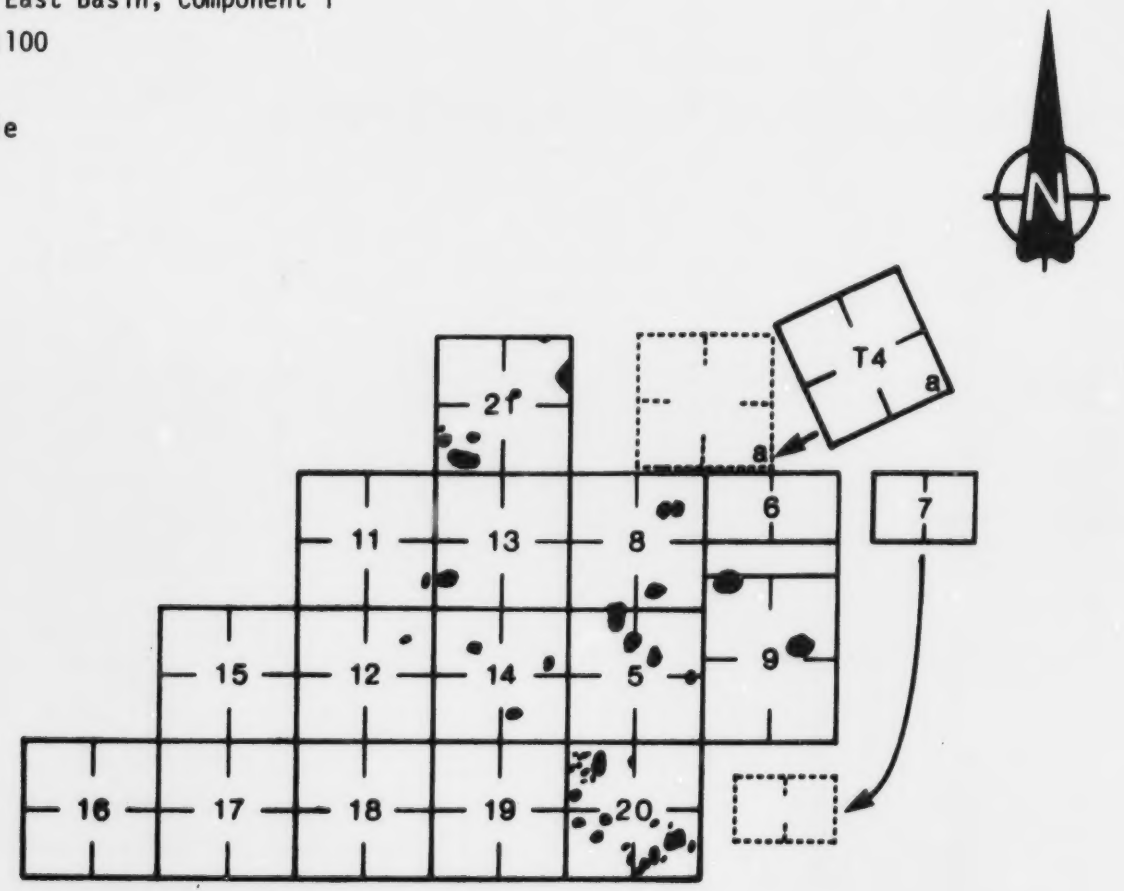


FIG. 10

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 1

Scale 1:50

TOOLS (N=)

- P Point, point fragments
- B Biface
- C Chopper
- S Scraper
- G Grinder
- R Retouched flake

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- ▲ Primary
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

* Symbols with subscript indicate fragments fit together.

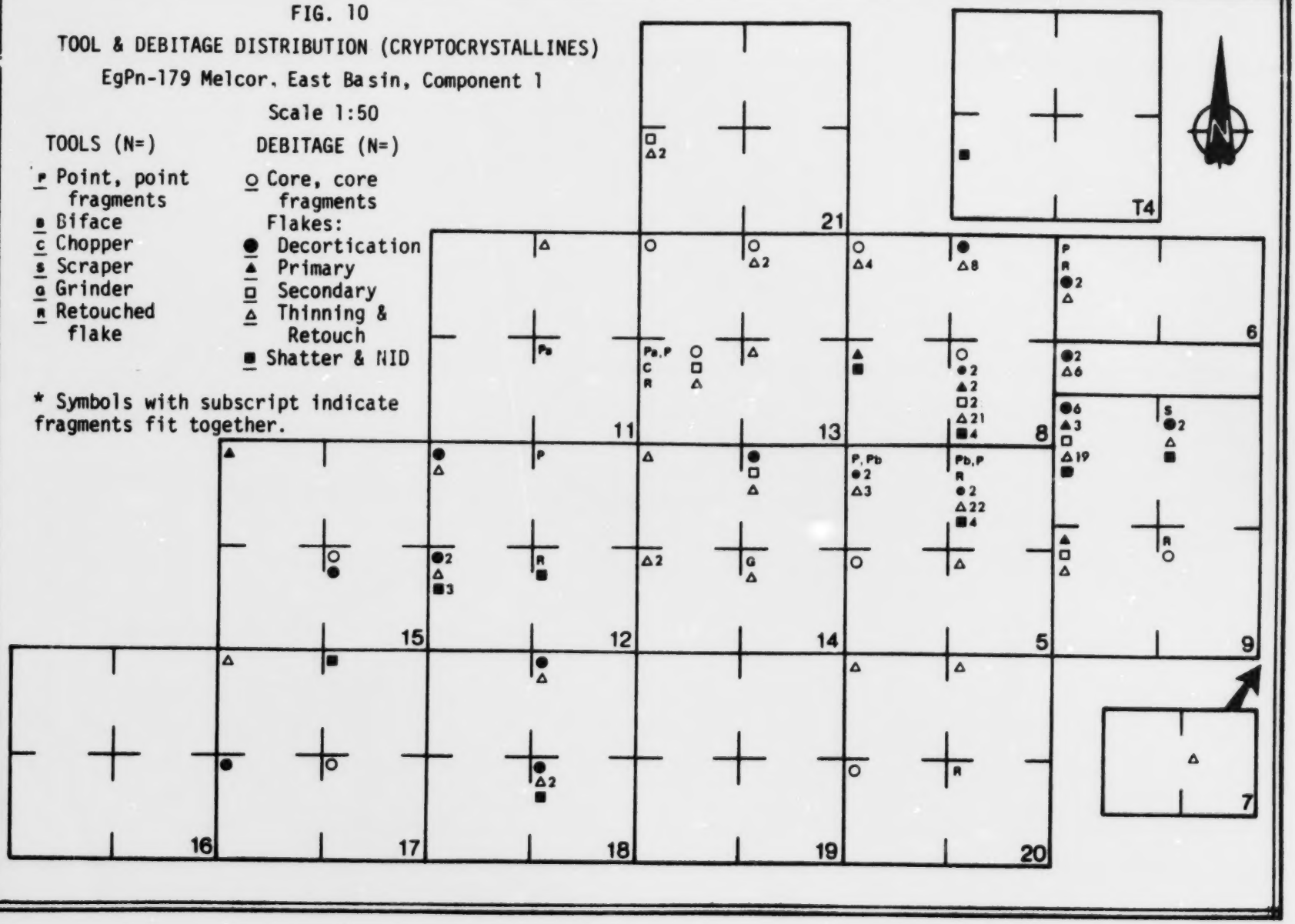


FIG. 11

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 1

Scale 1:50

TCOLS (N=)

- P Point, point fragments
- B Biface
- U Spall Tool
- C Chopper
- G Grinder

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

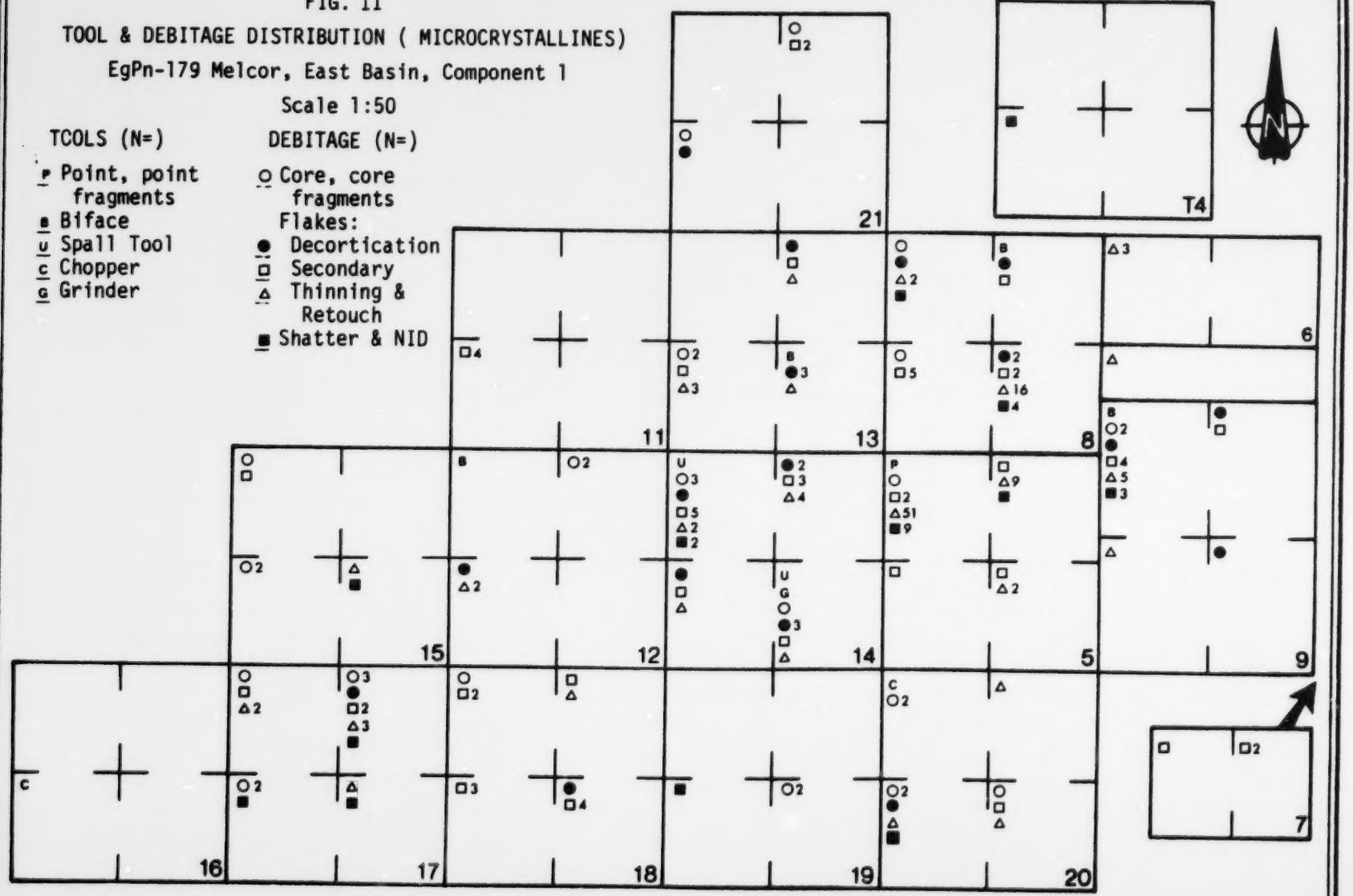


FIGURE 12:
STONE FEATURE DISTRIBUTION
Melcor, West Basin, Component 2
Scale 1:100

● Cobble

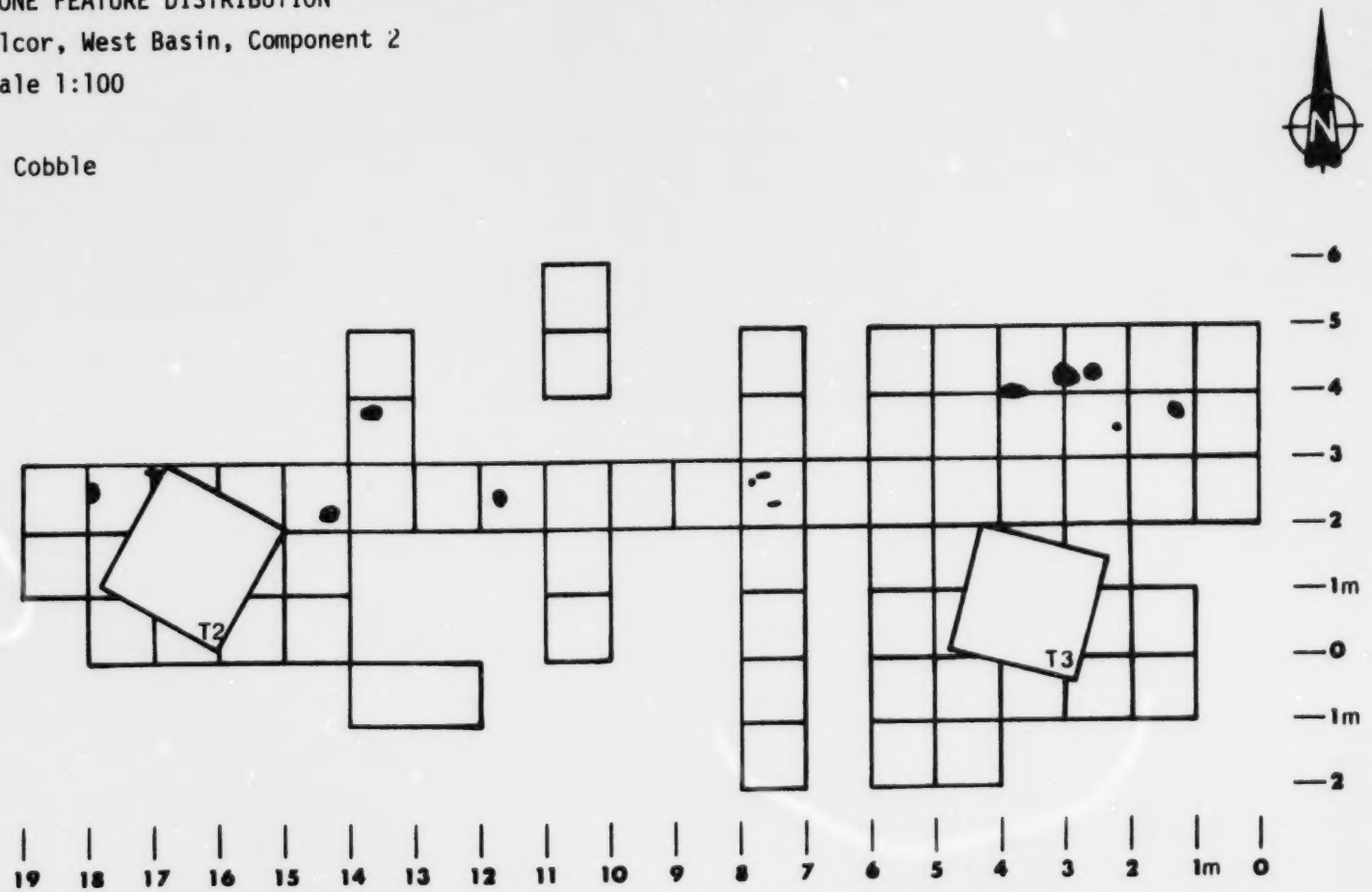


FIG. 13

TOOL & DEBITAGE DISTRBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, West Basin, Component 2

Scale 1:100

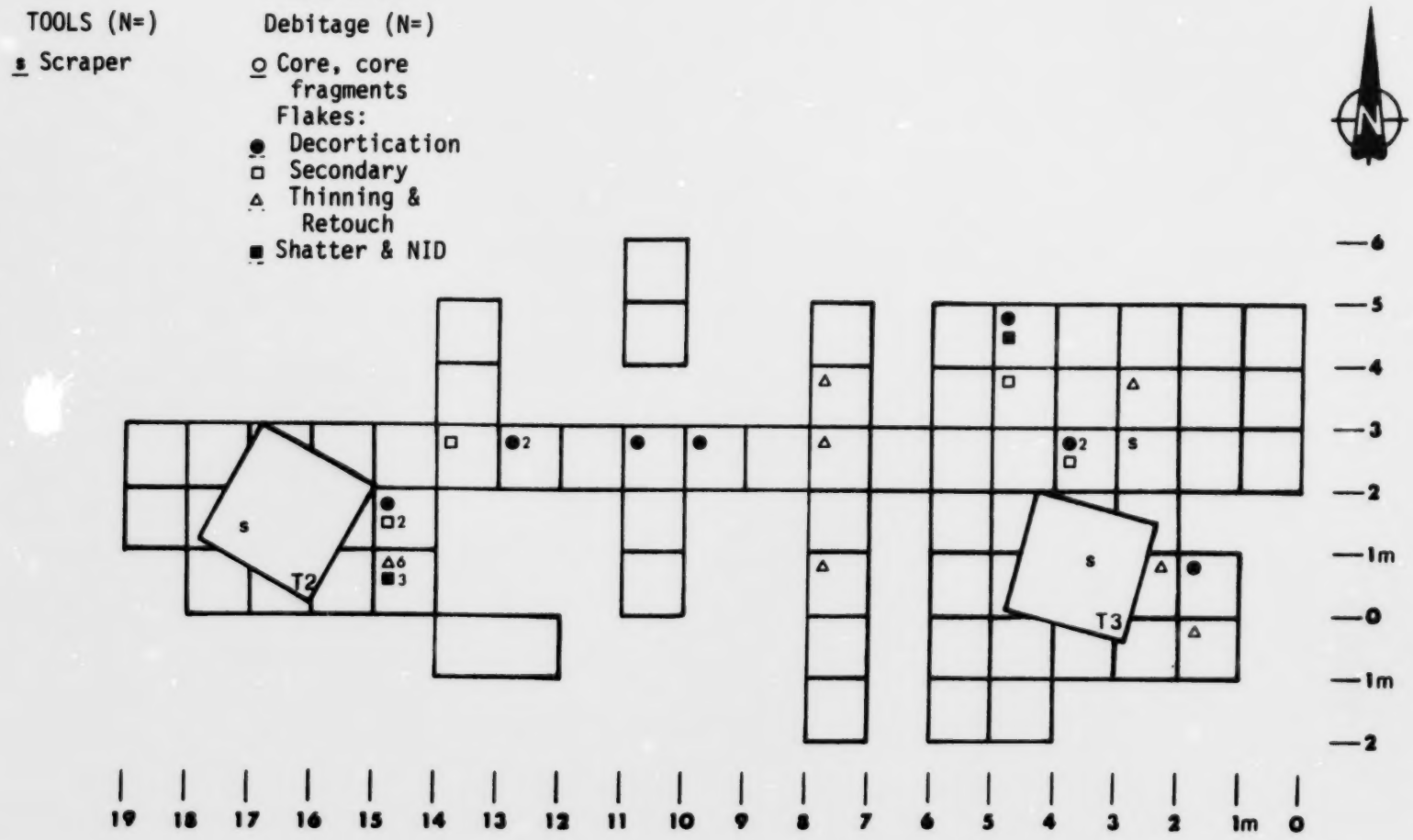


FIG. 14

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, West Basin, Component 2

Scale 1:100

TOOLS (N=)

- B Biface
- U Spall Tool
- C Chopper
- S Scraper
- H Hammerstone

DEBITAGE (N=)

- Core, core fragments
- Flakes:
  - Decortication
  - Secondary
  - Thinning & Retouch
  - Shatter & NID

Units enclosed reported as a single, larger unit.

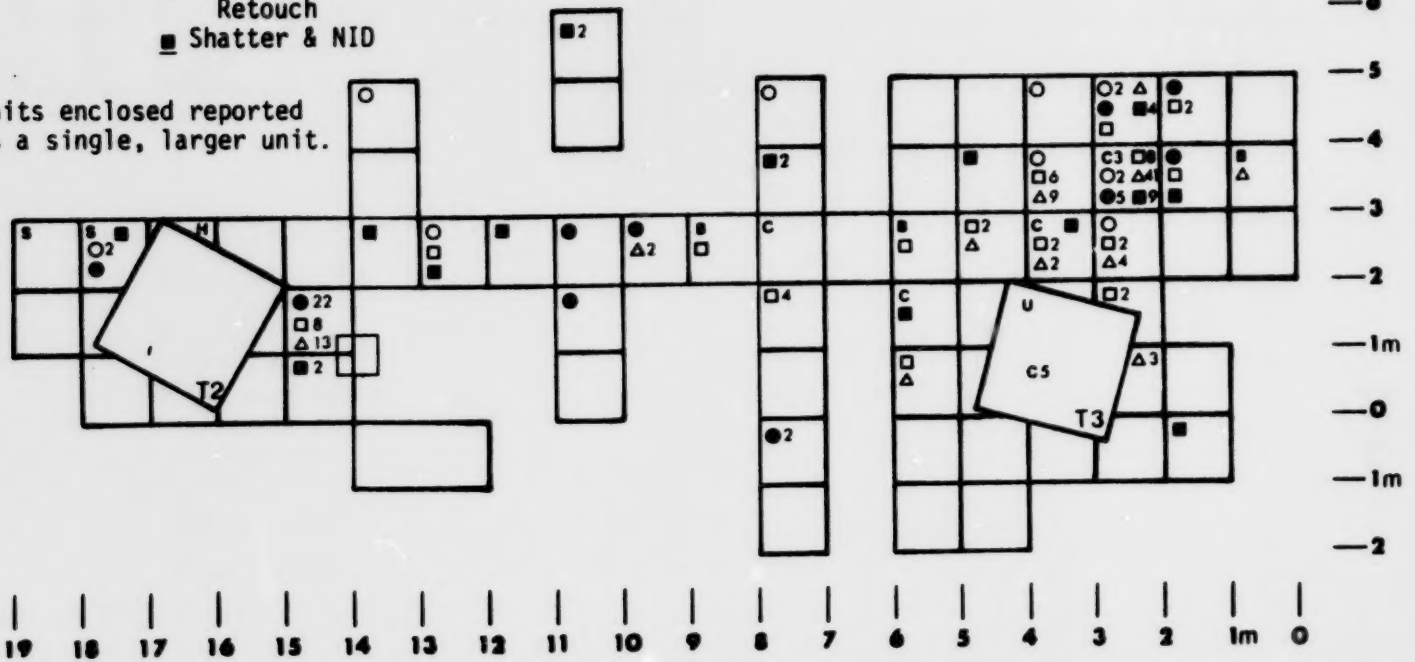


FIGURE 15:
STONE FEATURE DISTRIBUTION
Melcor, East Basin, Component 3
Scale 1:100

Cobble

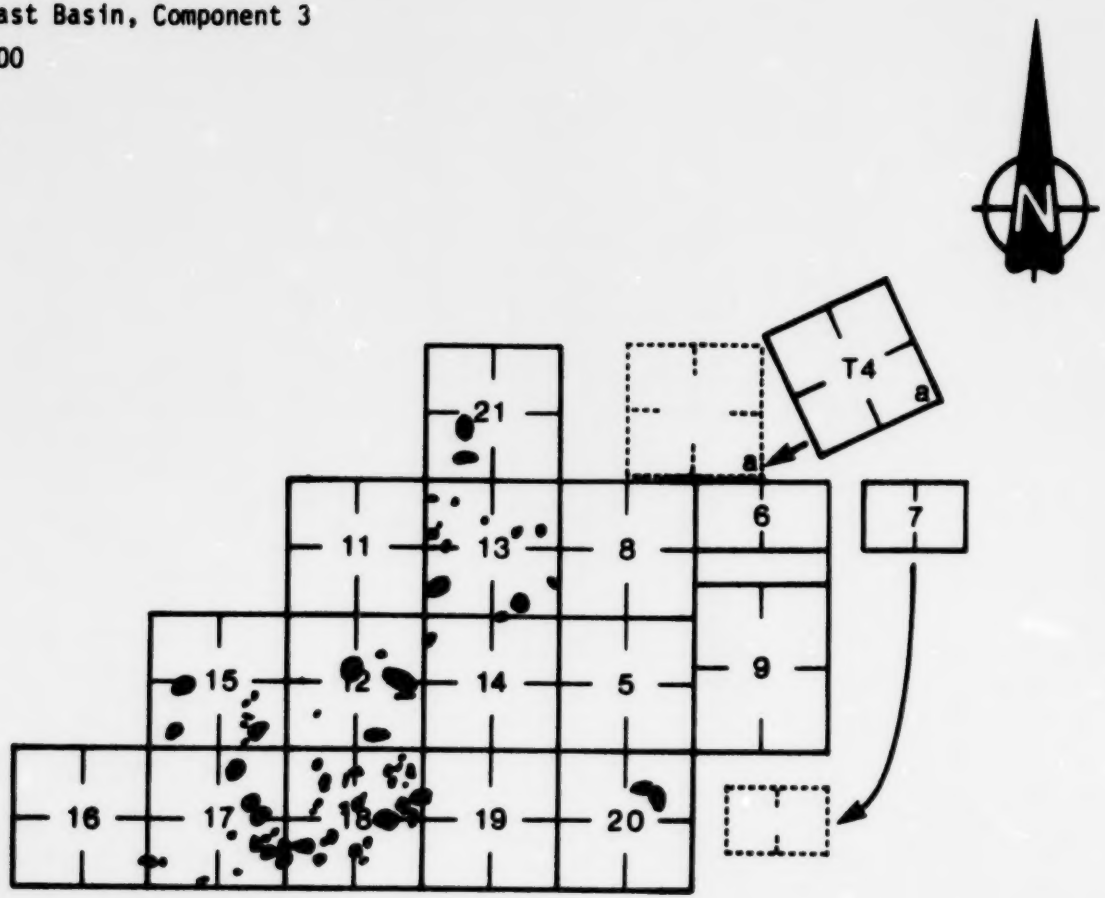


FIG. 16

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 3

Scale 1:50

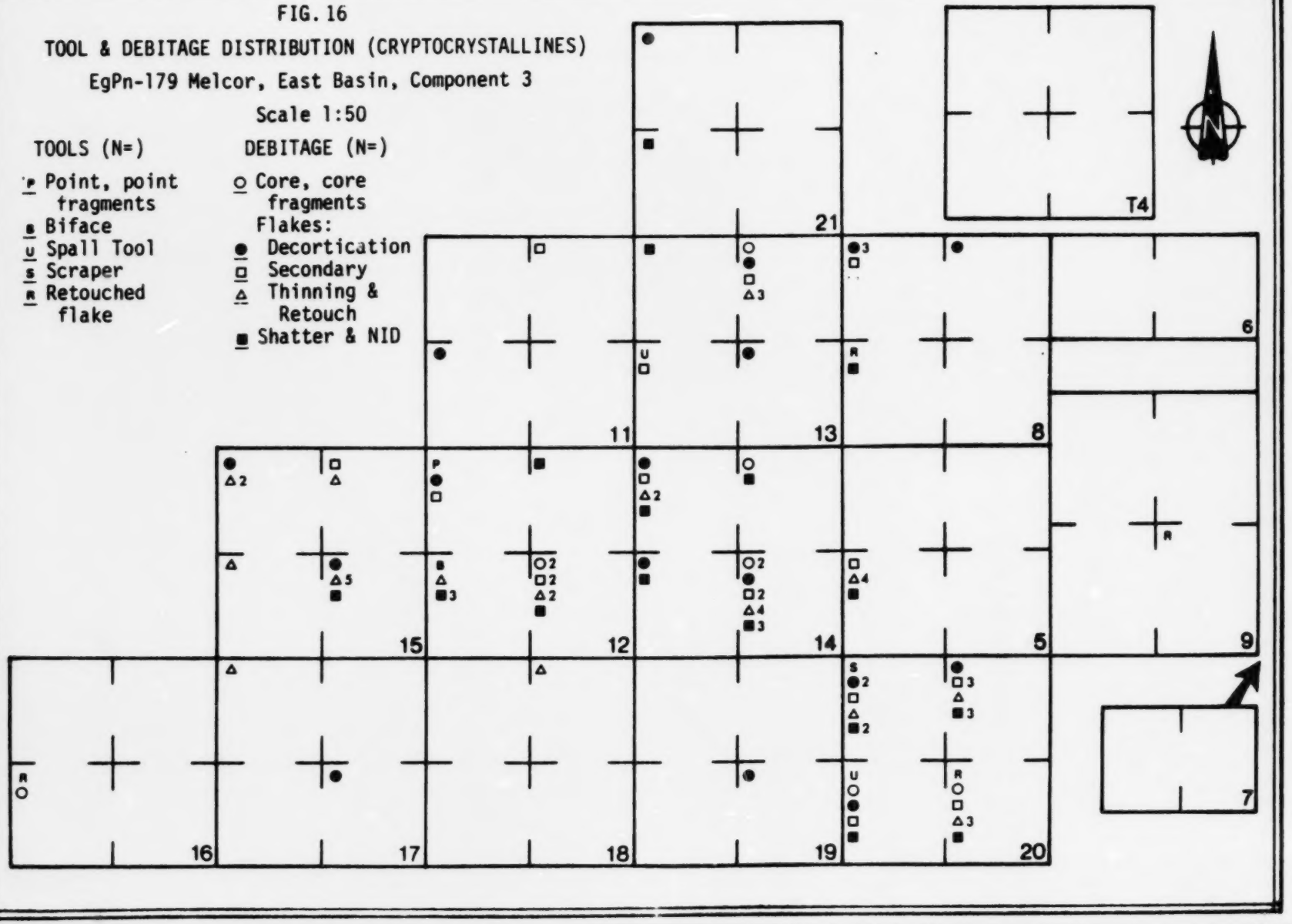


FIG. 17

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 3

Scale 1:50

TOOLS (N=)

- B Biface
- U Spall Tool
- C Chopper
- R Retouched flake
- H Hammerstone

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

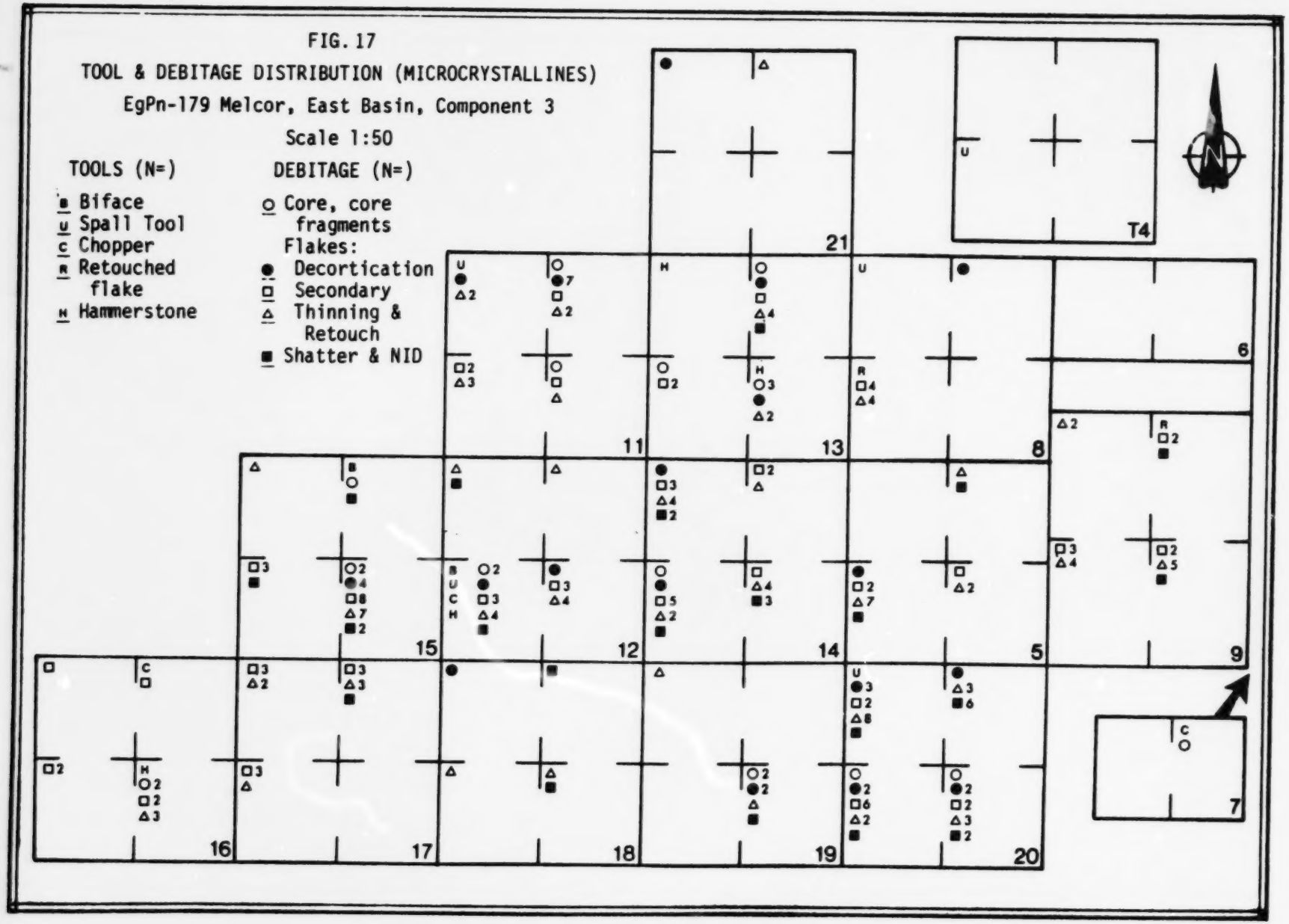


FIG. 18

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 4

Scale 1:50

TOOLS (N=)

- P Point, point fragments
- R Retouched flake
- W Wedge

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- ▲ Primary
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

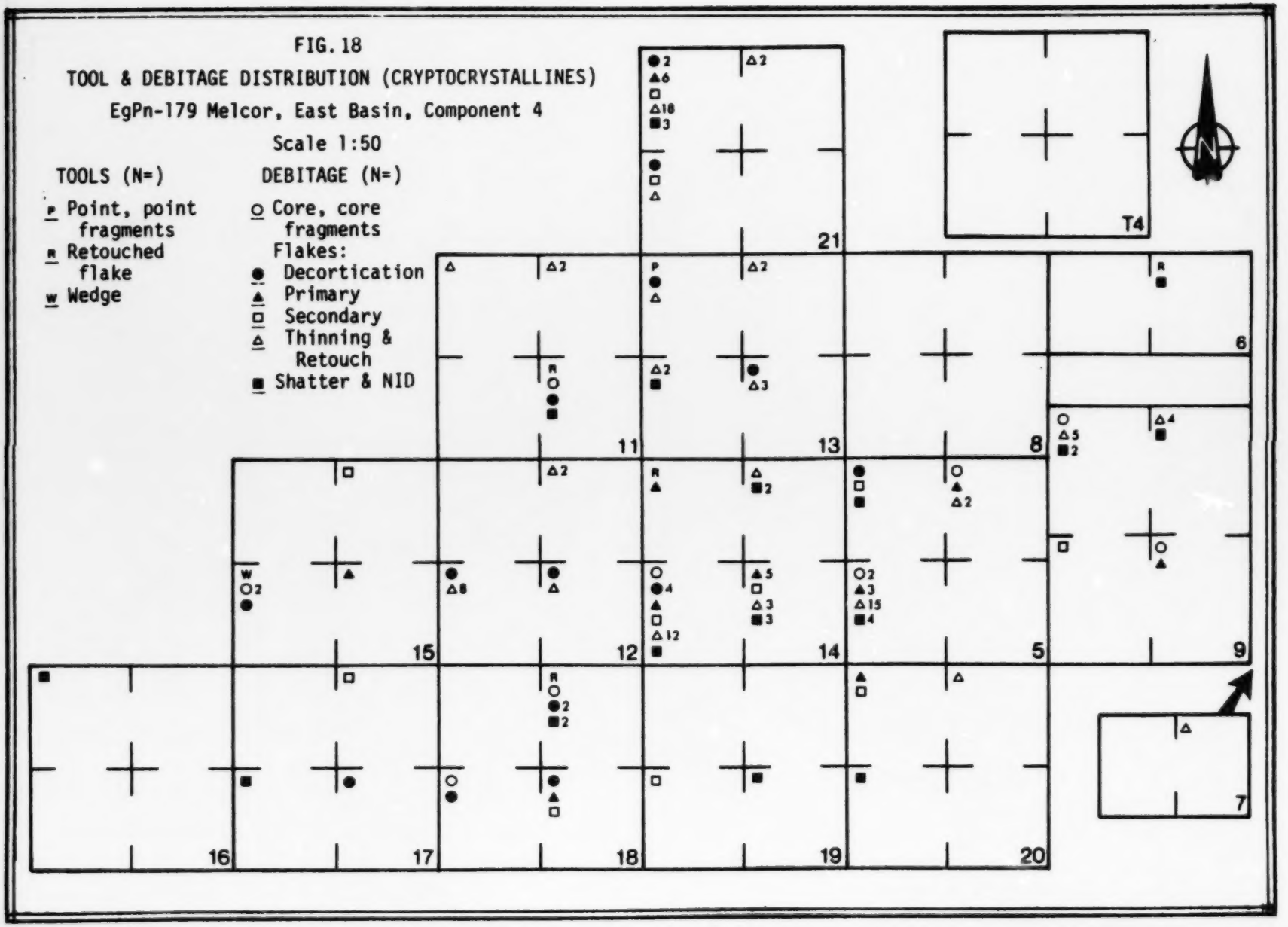


FIG. 19

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 4

Scale 1:50

TOOLS (N=)

- P Point, point fragments
- B Biface
- U Spall Tool
- S Scraper
- R Retouched flake
- W Wedge

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- ▲ Primary
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

* Symbols with subscript indicate fragments fit together.

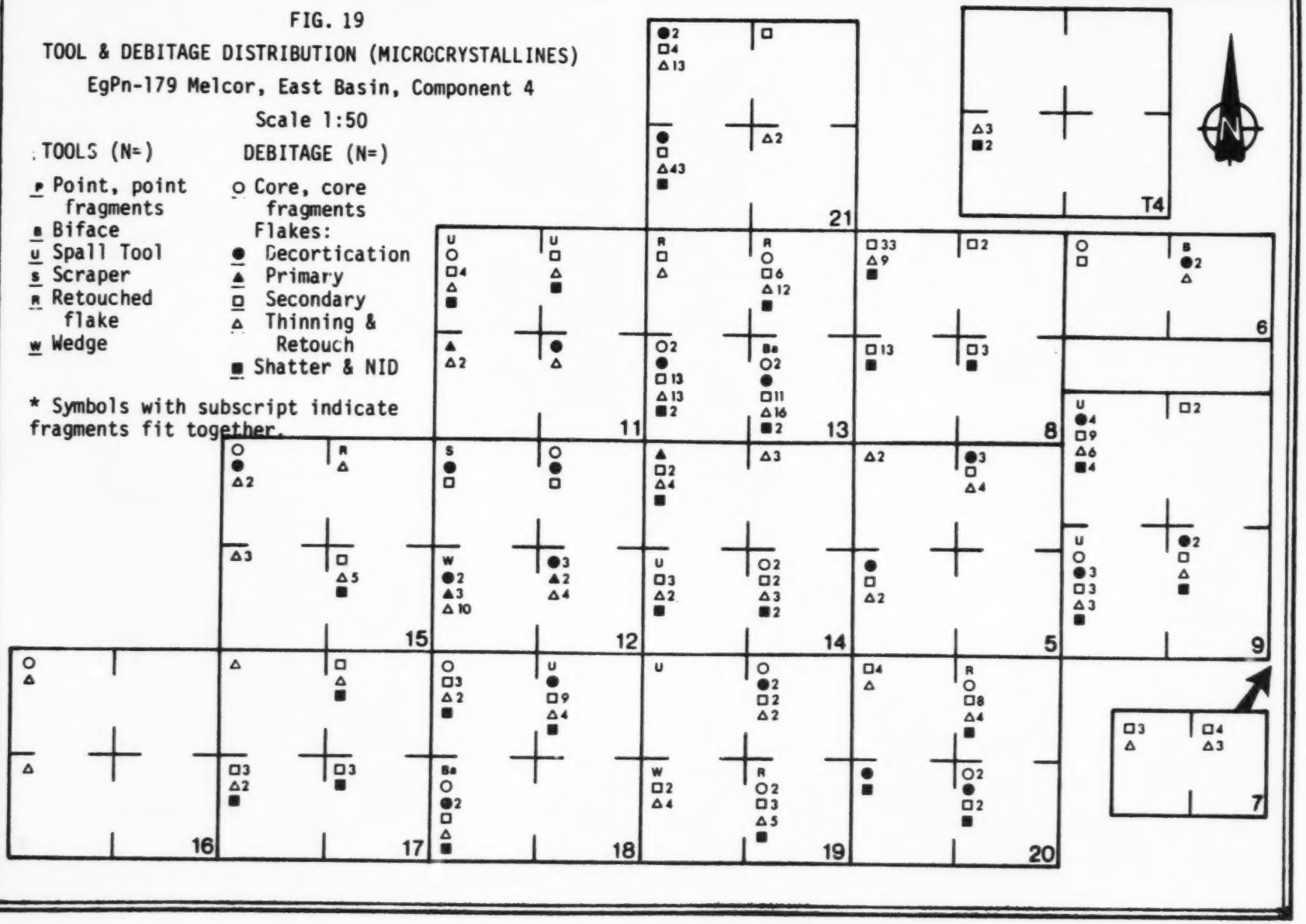


FIGURE 20:
STONE FEATURE DISTRIBUTION
Melcor, East Basin, Component 5
Scale 1:100

Cobble

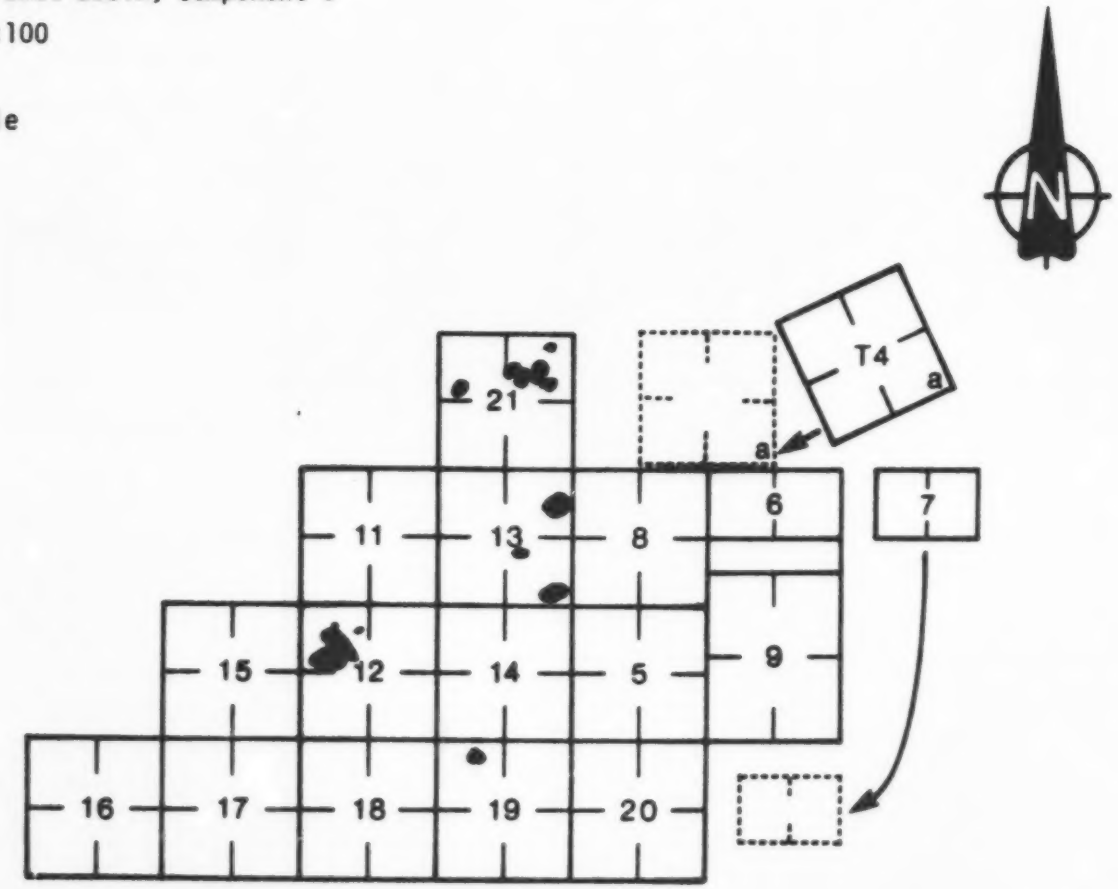


FIG. 21

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 5

Scale 1:50

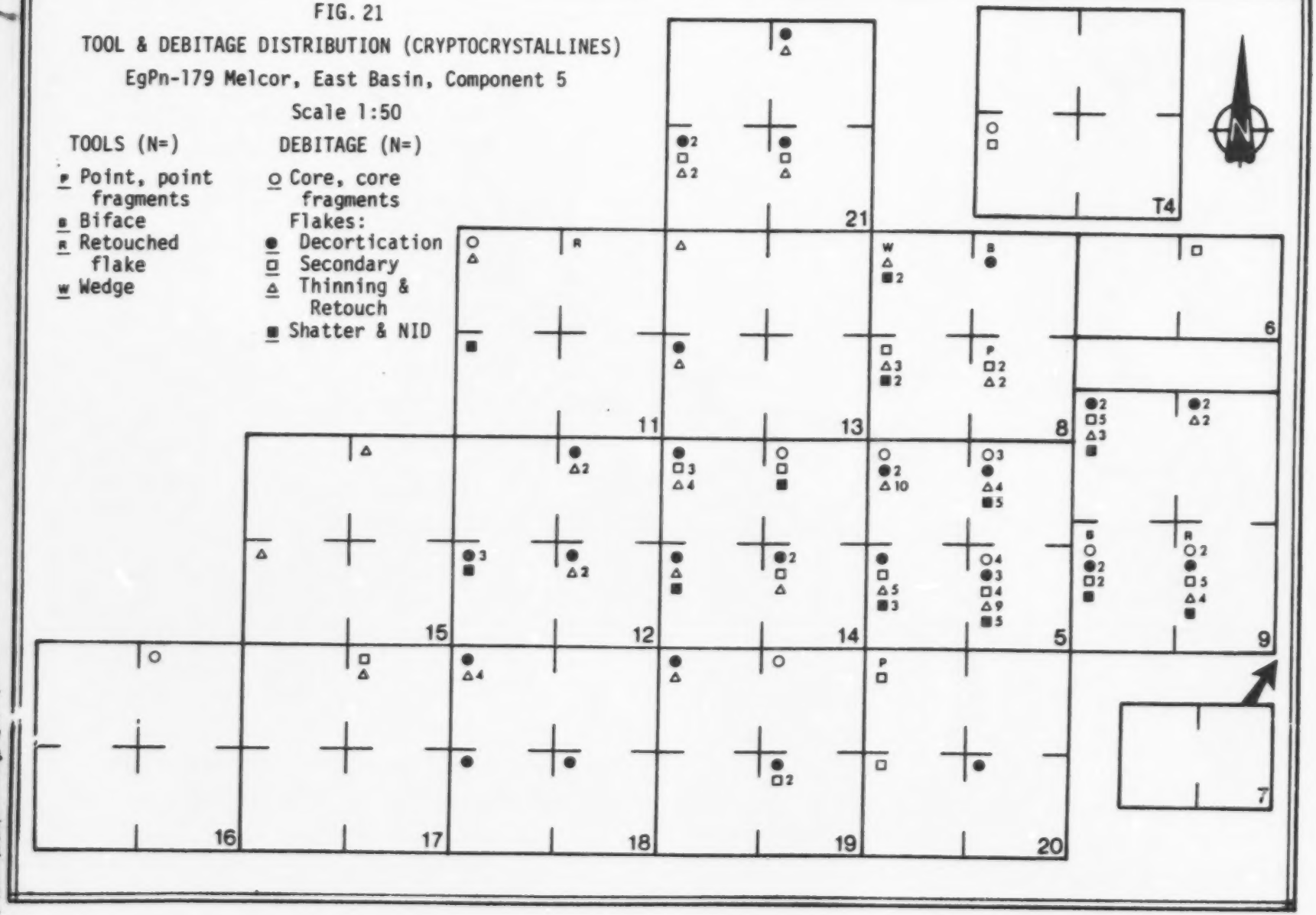


FIG. 22

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 5

Scale 1:50

TOOLS (N=)

- P Point, point fragments
- B Biface
- U Spall Tool
- C Chopper
- S Scraper
- R Retouched flake
- H Hammerstone
- W Wedge

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- ▲ Primary
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

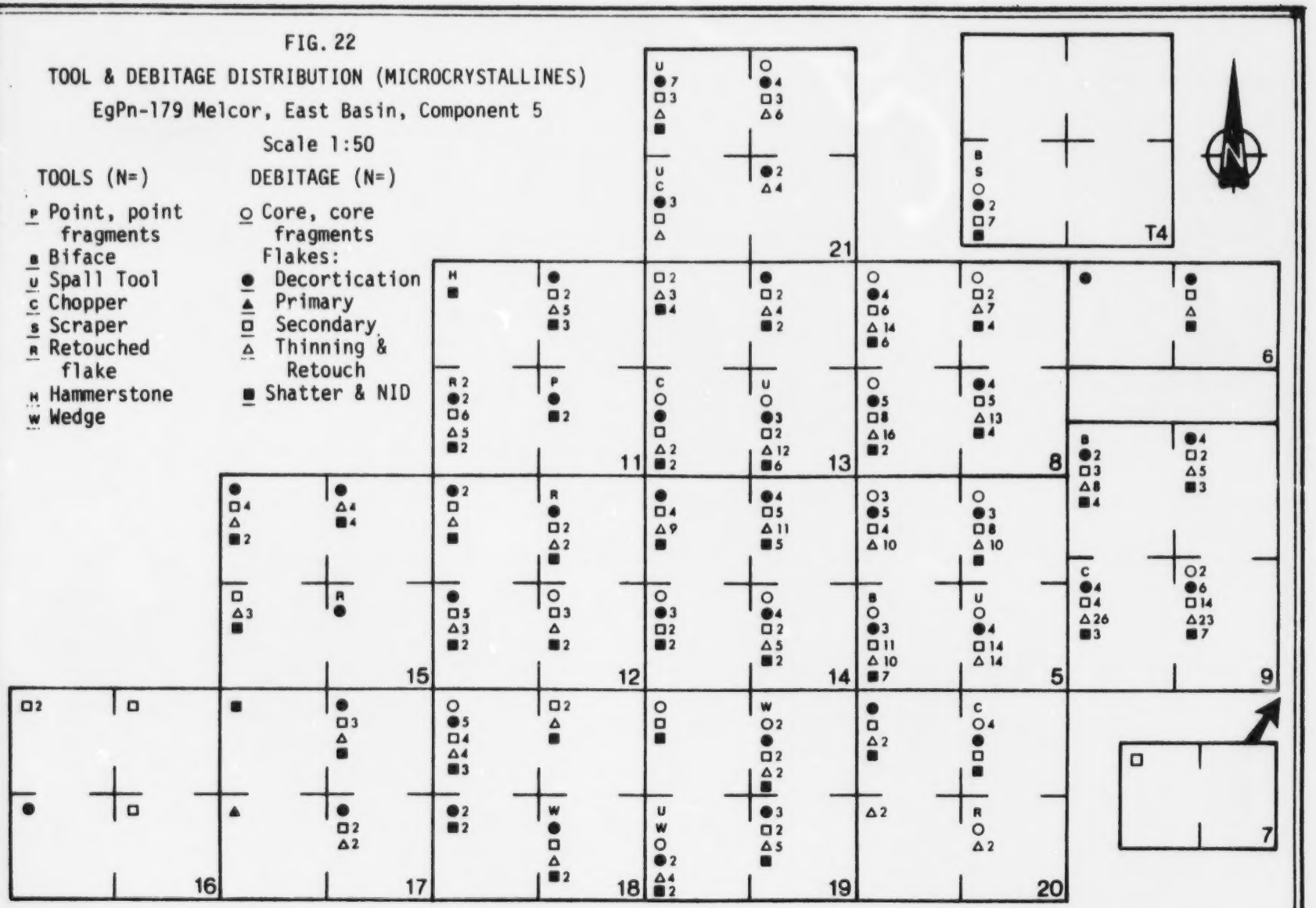


FIGURE 23:
STONE FEATURE DISTRIBUTION
Melcor, West Basin, Component 5
Scale 1:100

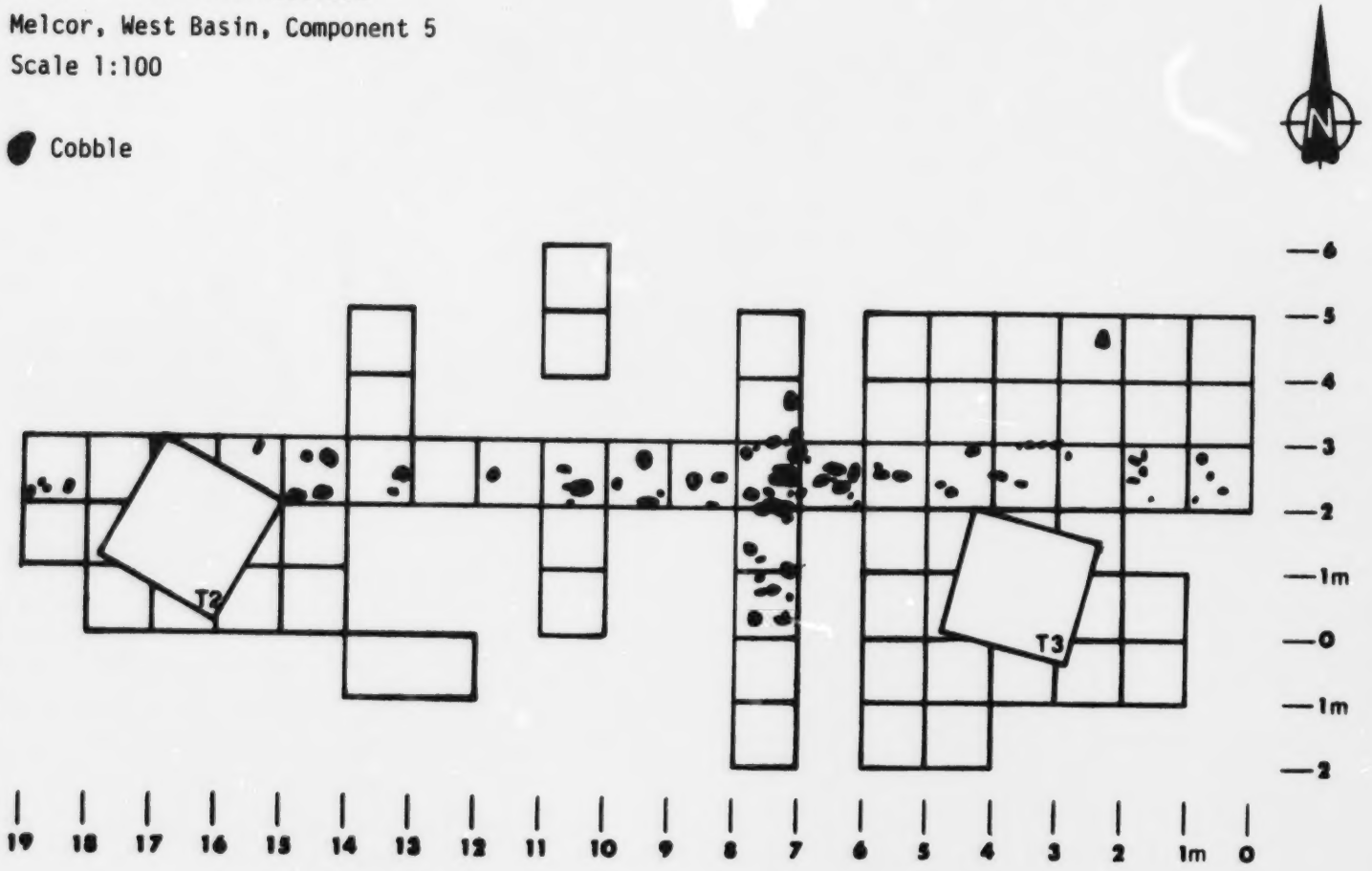


FIG. 24

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, West Basin, Component 5

Scale 1:100

TOOLS (N=)

- P Point, point fragments
- C Chopper
- S Scraper
- R Retouched flake
- W Wedge

DEBITAGE (N=)

- O Core, core Fragments
- Flakes:
- ● Decortication
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

* Symbols with subscript indicate fragments fit together.

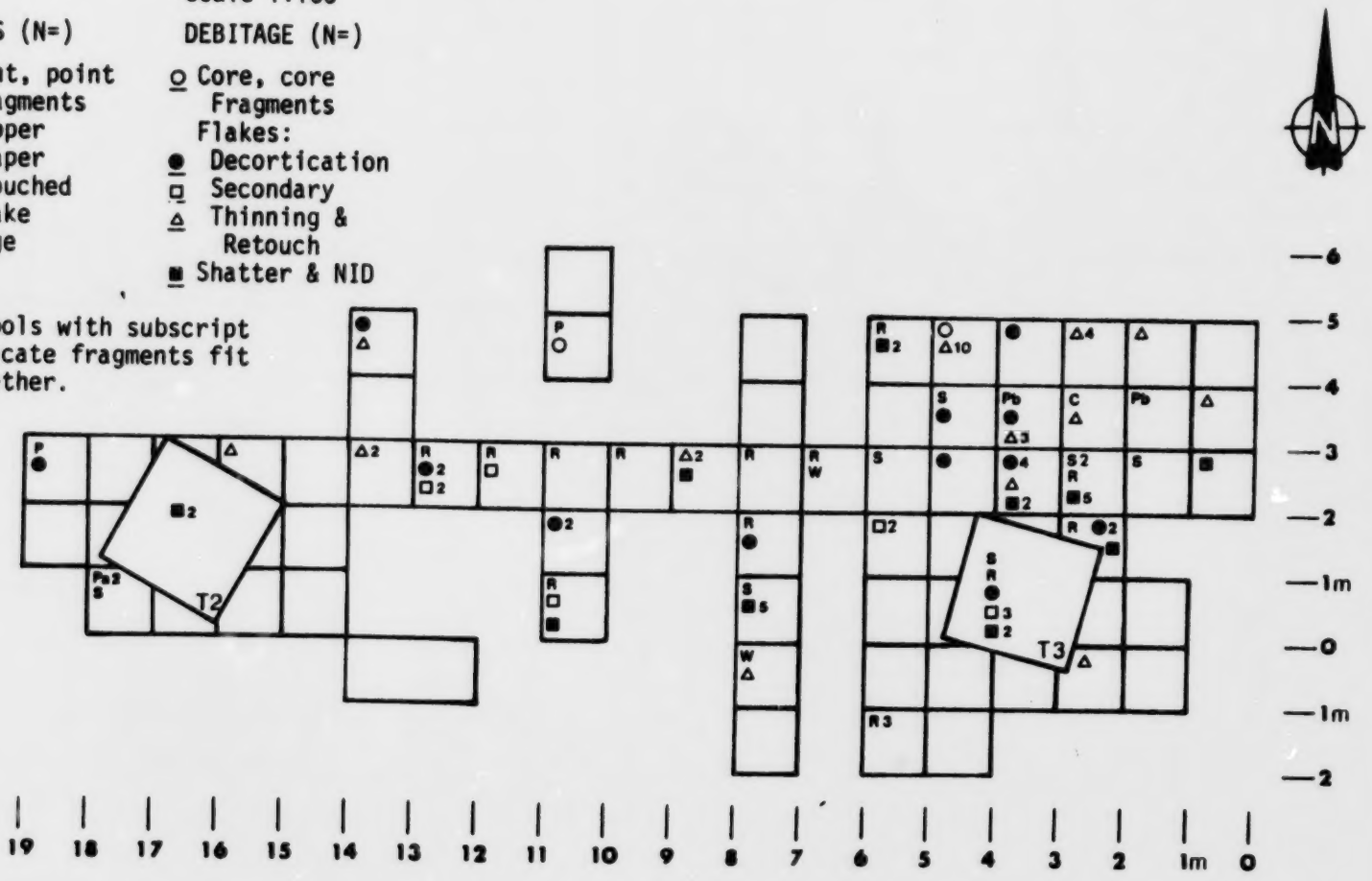


FIG. 25

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, West Basin, Component 5

Scale 1:100

TOOLS (N=)

- B Biface
- U Spall Tool
- C Chopper
- R Retouched flake
- H Hammerstone
- W Wedge

DEBITAGE (N=)

- O Core, core fragments

Flakes:

- ● Decortication
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID

Units enclosed reported as a single, larger unit.

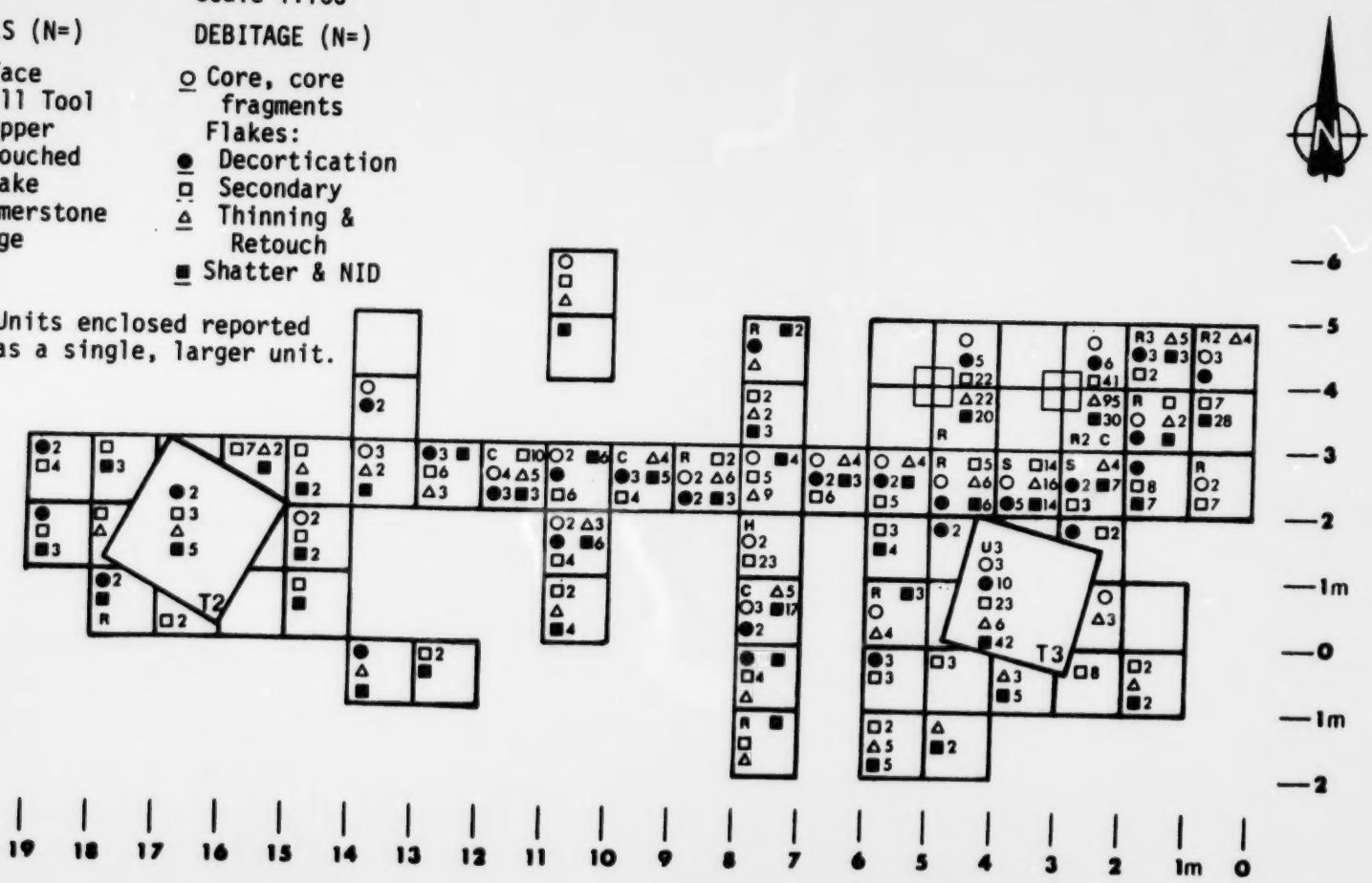


FIG. 26

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 6

Scale 1:50

TOOLS (N=0)

DEBITAGE (N=)

- Core, core fragments
- Flakes:
- Decortication
- Secondary
- Thinning & Retouch
- Shatter & NID

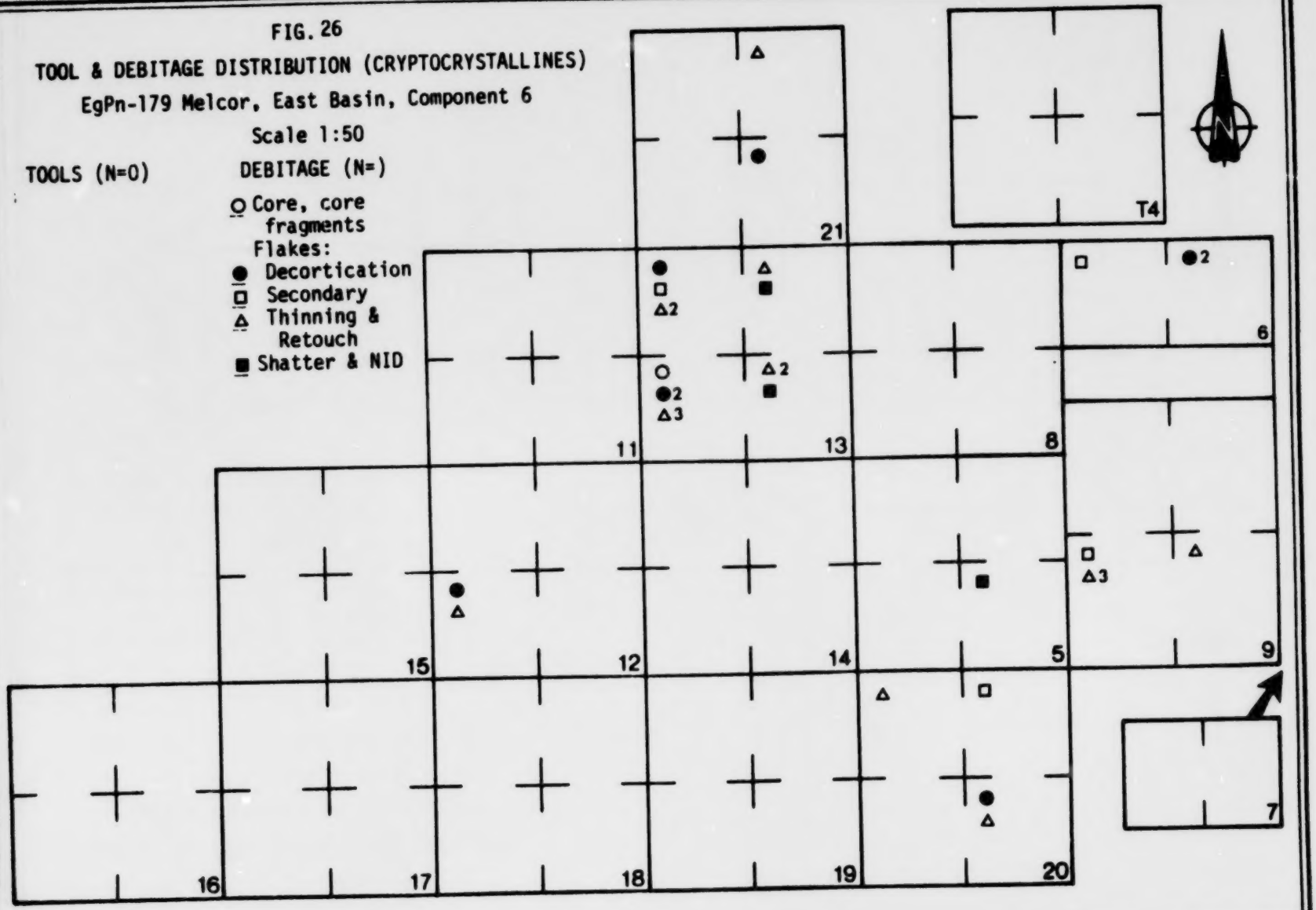


FIG. 27

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, East Basin, Component 6

Scale 1:50

TOOLS (N=0)

DEBITAGE (N=)

- Core, core fragments
- Flakes:
- Decortication
- Primary
- Secondary
- Thinning & Retouch
- Shatter & NID

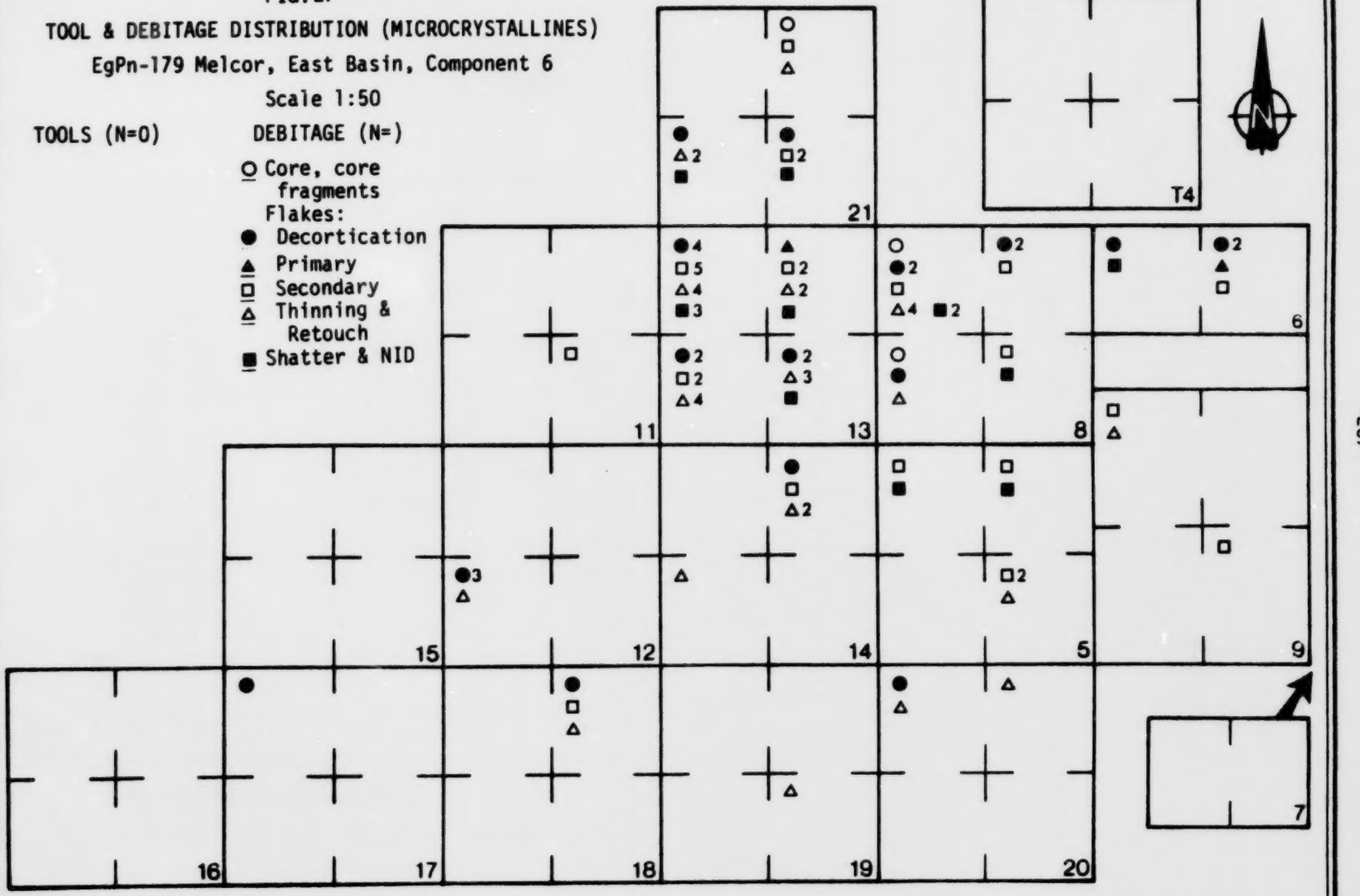


FIGURE 28:
STONE FEATURE DISTRIBUTION
Melcor, West Basin, Component 6
Scale 1:100

● Cobble

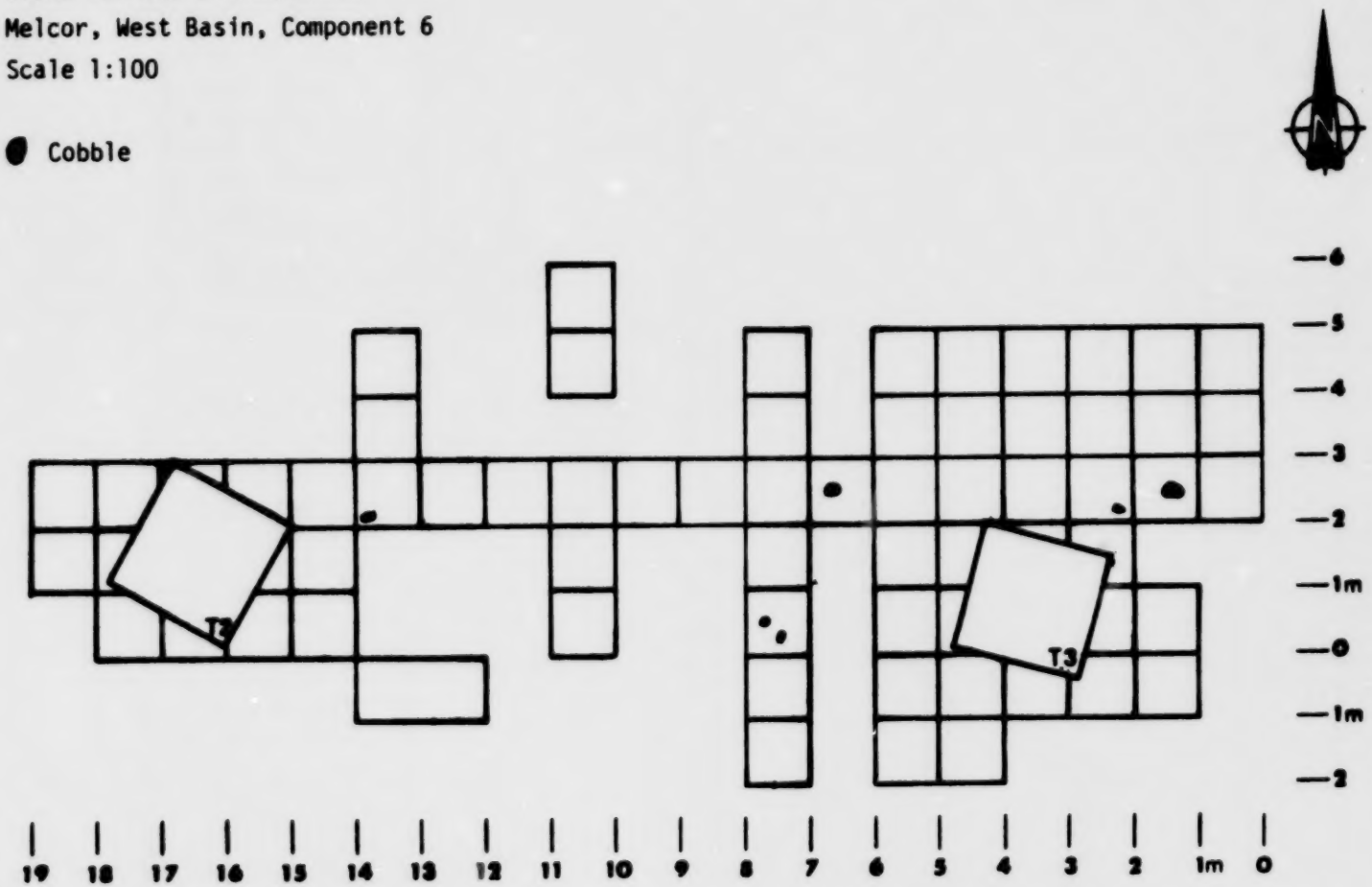


FIG. 29

TOOL & DEBITAGE DISTRIBUTION (CRYPTOCRYSTALLINES)

EgPn-179 Melcor, West Basin, Component 6

Scale 1:100

TOOLS (N=)

P Point, point fragments
S Scraper
R Retouched flake

DEBITAGE (N=)

○ Core, core fragments
Flakes:
● Decortication
□ Secondary
△ Thinning & Retouch
■ Shatter & NID

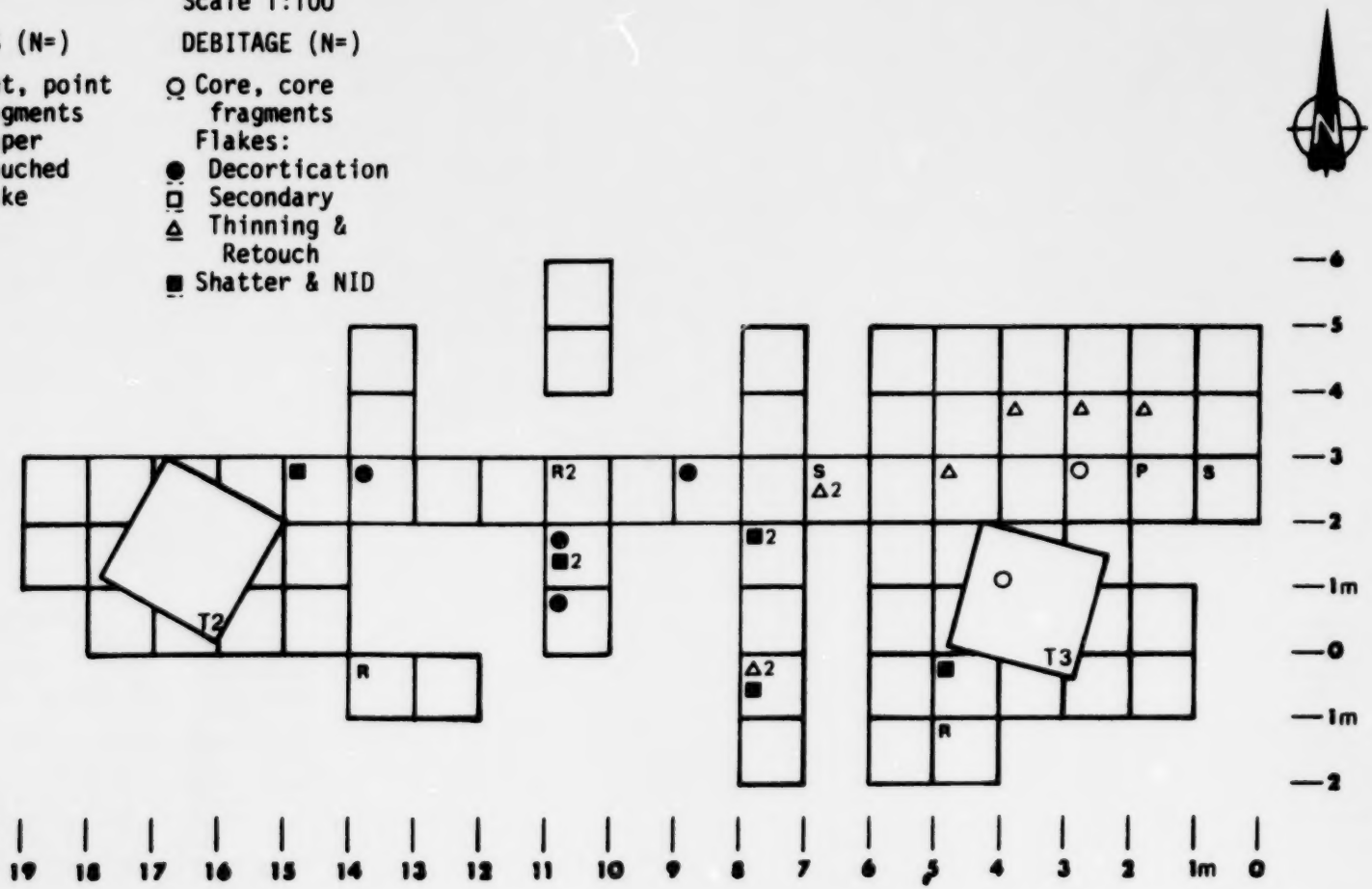


FIG. 30

TOOL & DEBITAGE DISTRIBUTION (MICROCRYSTALLINES)

EgPn-179 Melcor, West Basin, Component 6

Scale 1:100

TOOLS (N=)

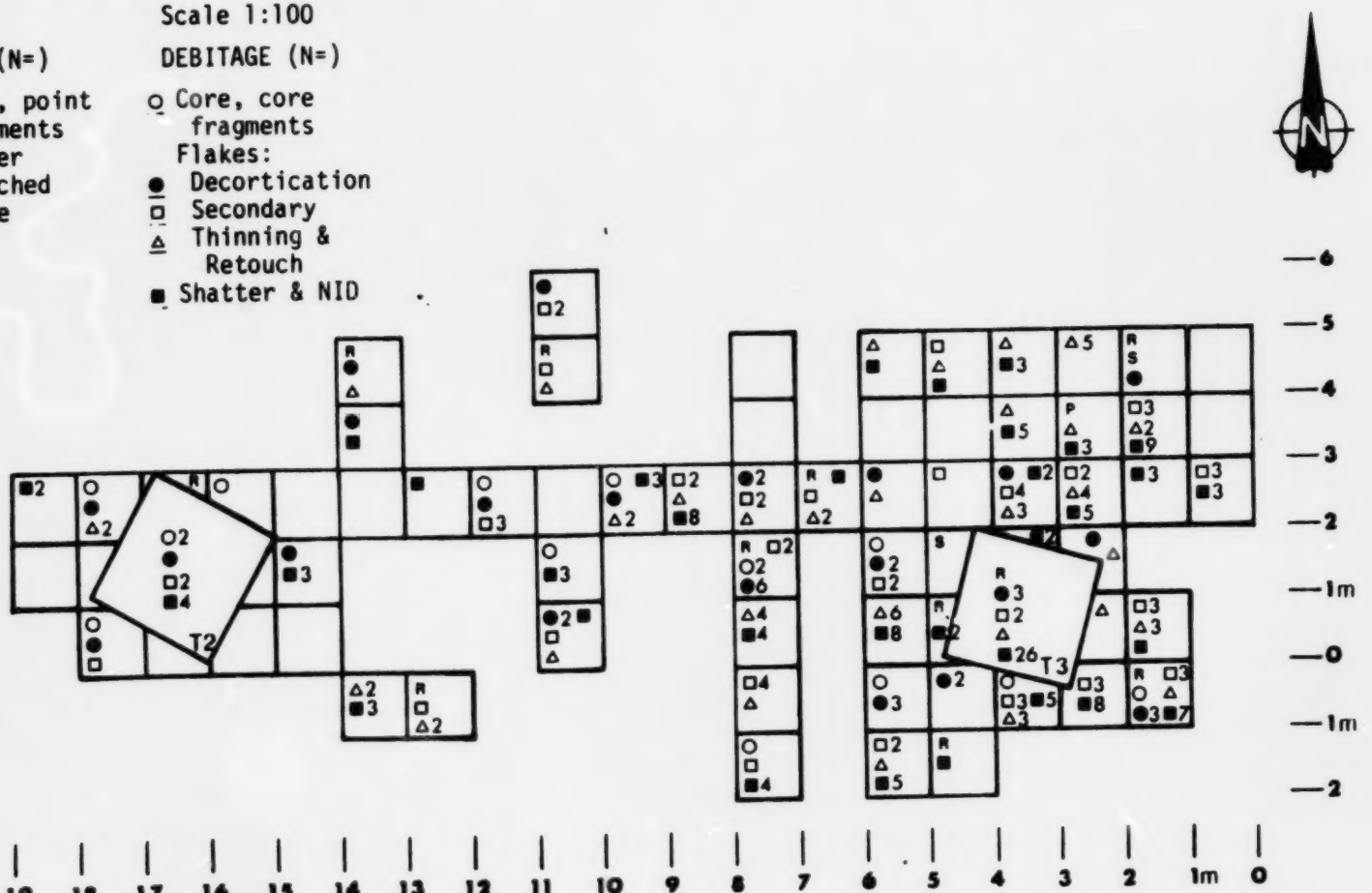
- P Point, point fragments
- S Scraper
- R Retouched flake

DEBITAGE (N=)

- ○ Core, core fragments

Flakes:

- ● Decortication
- □ Secondary
- △ Thinning & Retouch
- ■ Shatter & NID



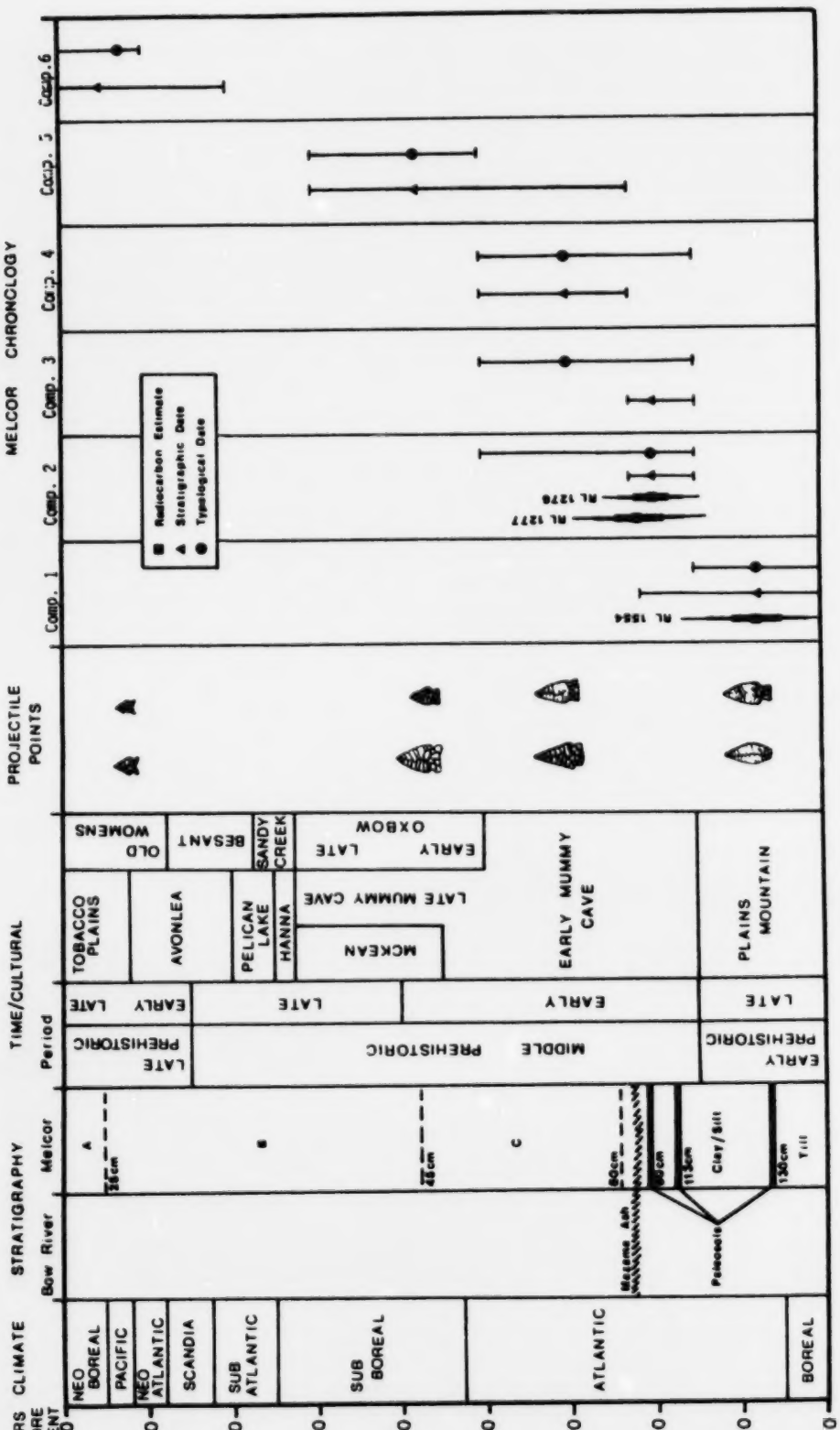


FIGURE 31. CHRONOLOGICAL SEQUENCE.

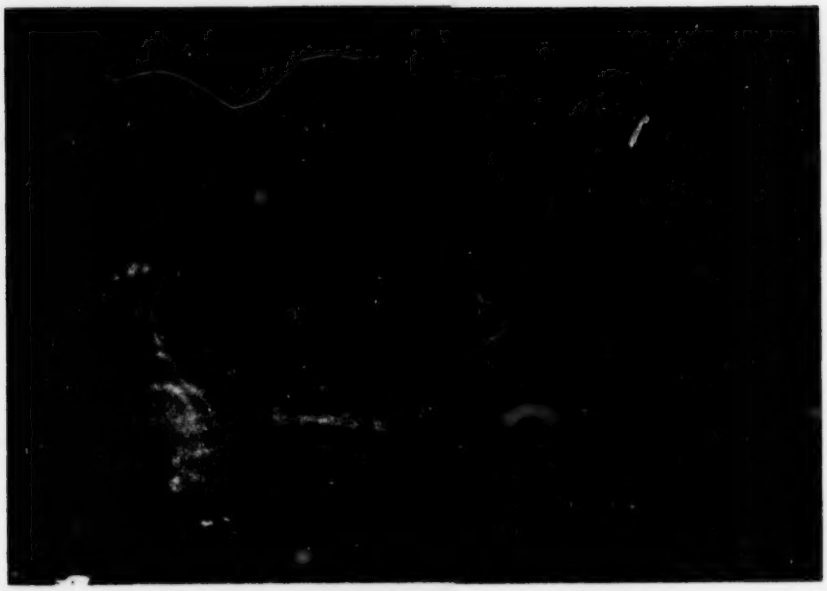


PLATE 1: EgPm-179 - West Basin before excavation, aerial view west.

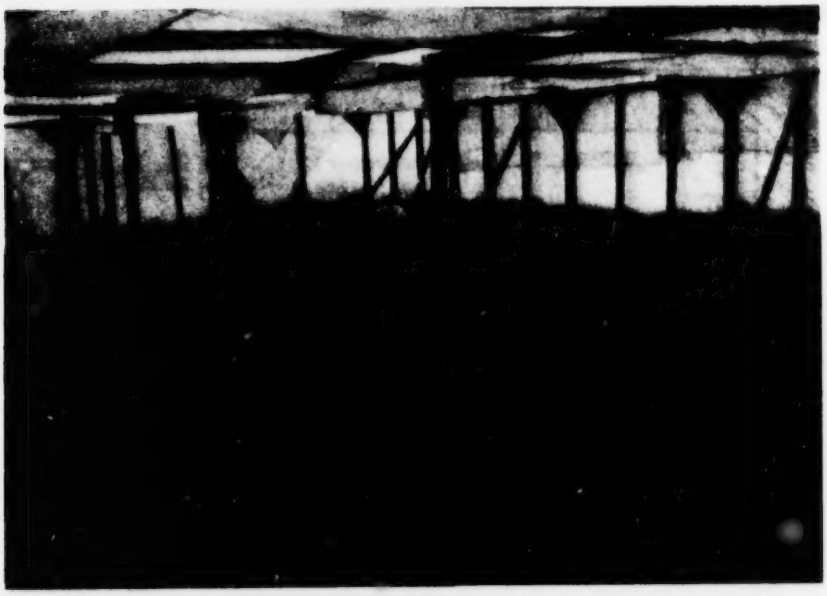


PLATE 2: EgPm-179, Inside shelter prior to excavation. Straw overlay to reduce frost penetration. 1979 test excavation in foreground.

PLATE 3: EgPm-179, excavation in progress in shelter heated by propane jet heater.

PLATE 4: EgPm-179, West Basin soil profile of north wall, unit 3N2W. Numbered arrows indicate component positions. Component 2 Early Mummy Cave; Component 5 Late Mummy Cave and Component 6 Late Prehistoric.

PLATE 5: EgPm-179, East Basin soil profile, south wall, Units 17 and 18.

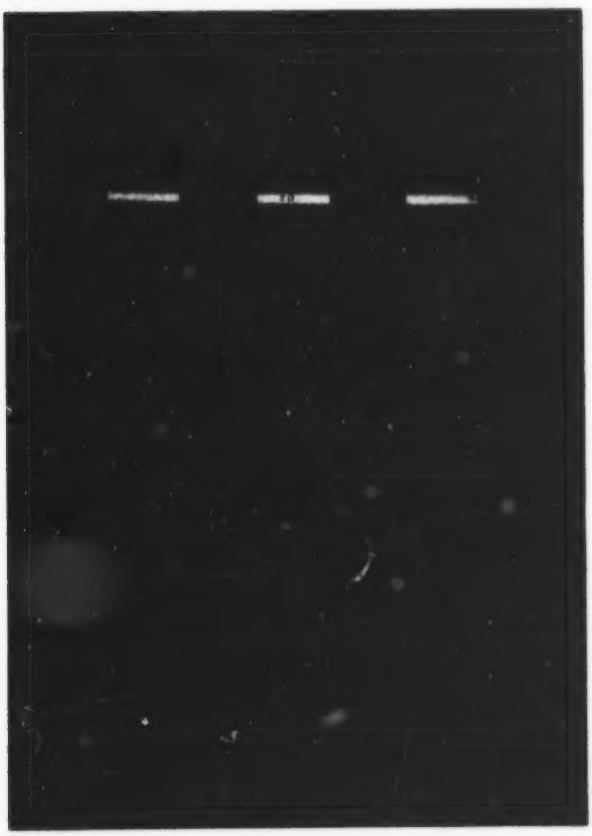


PLATE 6: EgPm-179, East Basin - Component 1 Floor (Plains/ Mountain Complex) looking west. Lusk point and quartzite biface in centre.

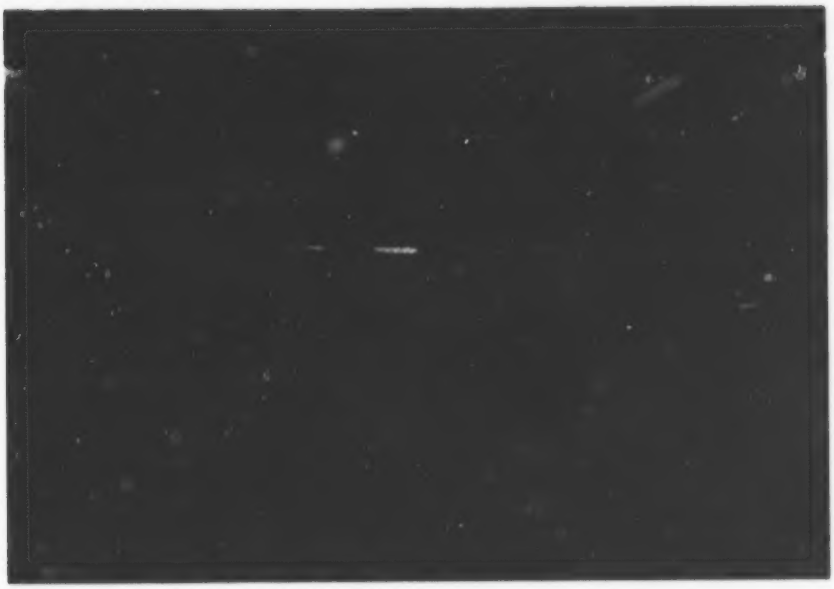


PLATE 7: EgPm-179, West Basin - Component 2 floor (Early Mummy Cave). Large quartzite core-choppers in situ, view north.

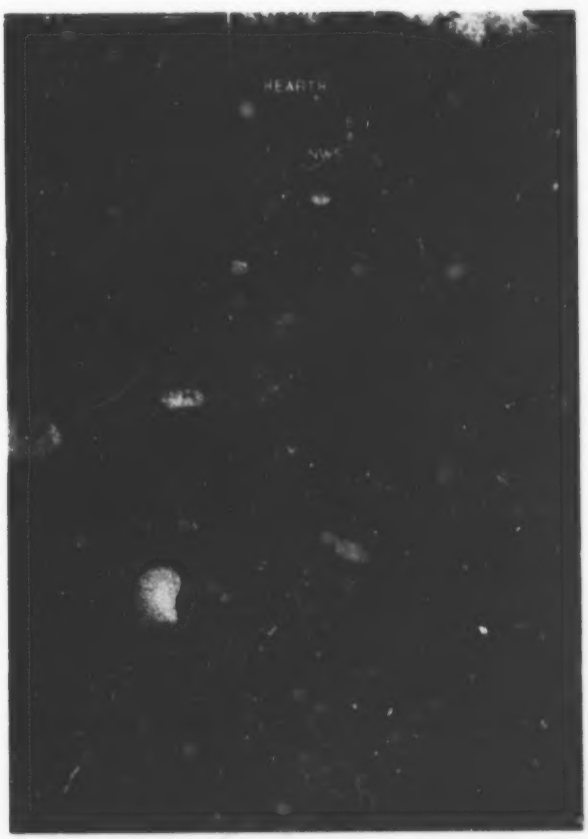


PLATE 8: EgPm-179, West Basin-Component 5 (Late Mummy Cave). Hearth looking east, Unit 5N2W.

PLATE 9: EgPm-179, West Basin - Component 5 (Late Mummy Cave). Hearth looking east, Unit 3N6W.

Plate 10: EgPm-179, East Basin - Component 5 (Late Mummy Cave). Hearth looking north, Unit 21.

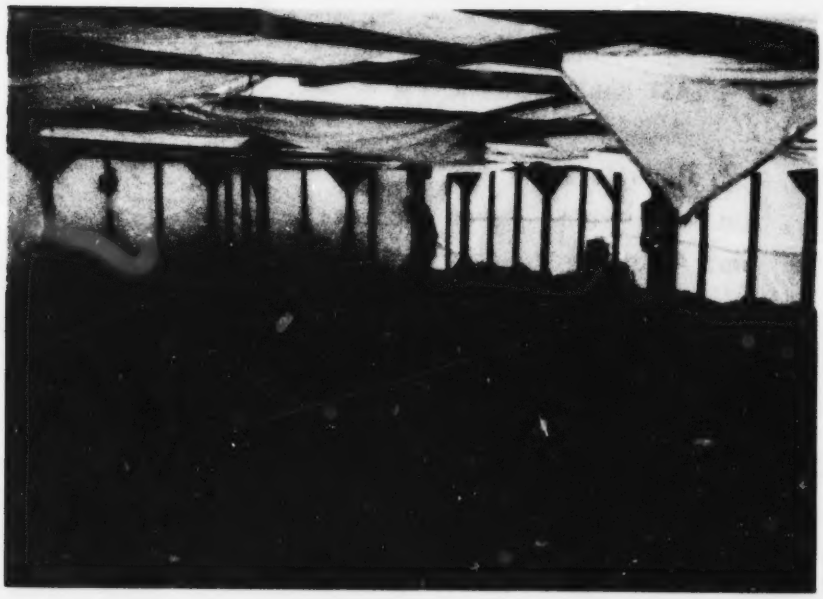


PLATE 11: EgPm-179, West Basin, view east of excavation area. Note the "linear" layout of the excavation units.

PLATE 12: View west from EgPm-179 showing Nosehill Uplands topography.

PLATE 13 - EAST BASIN COMPONENT 1

1. Lust Projectile Point
2. Salmon River Side Notched Projectile Point
3. Stemmed Atlatl Projectile Point
4. Projectile Point Preform Midsection
5. Stemmed Base
6. Biface - Symmetrical Lanceolate Bipoint

7 - 8. Bifaces - Symmetrical Ovate - Straight Base

9. Split Chert Pebble End Scraper

1

2

3

6

4

5

7

8

9

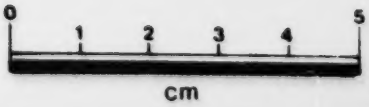
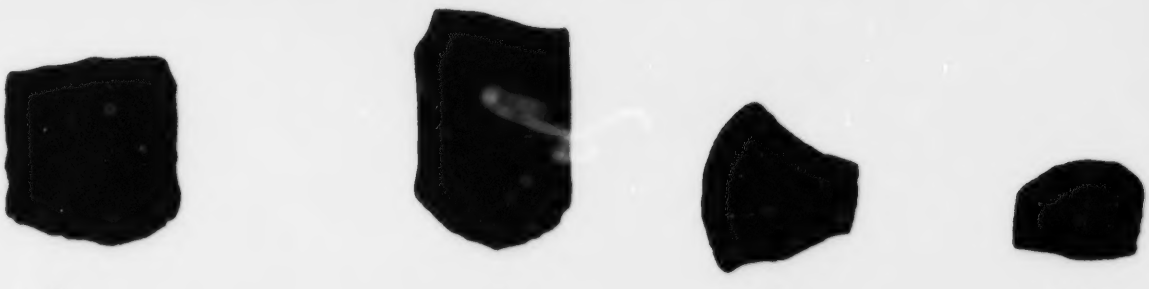


PLATE 14 - WEST BASIN COMPONENT 2

1 - 3. Quartzite Bifaces - Assymetrical Ovate

4 - 7. Petrified Wood and Pebble Chert End Scrapers

1 2 3



4 5 6 7

PLATE 15 - WEST BASIN COMPONENT 2

8. Quartzite Core-Chopper

8

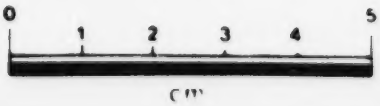
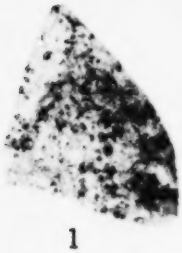


PLATE 16 - EAST BASIN COMPONENT 3

1. Assymetrical Projectile Point Tip

2 - 3. Bifaces - Symmetrical Ovate



1

3

2

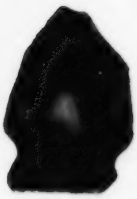
PLATE 17 - EAST BASIN COMPONENT 4

1 - 2. Bitterroot Side Notched Atlatl Projectile Points

3. Biface - Assymetrical Lanceolate

4. Biface - Body and Tip - Symmetrical Ovate

5. Quartzite End Scraper



1

2

4

3

5

PLATE 18 - EAST BASIN COMPONENT 5

1 - 2. Oxbow Side Notched Projectile Points

3. Biface Fragment - Assymetrical Ovate

4. Chalcedony Retouched Flake - Possible Composite Wedge and End Scraper

1

2

3

4

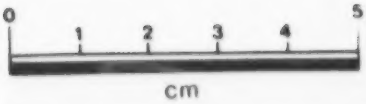


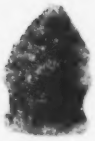
PLATE 19 - WEST BASIN COMPONENTS 5 and 6

1. Late Plains Projectile Point

2. Hanna Side Notched Point - Broken

3, 4 - 5. Oxbow Side Notched Projectile Points

6 - 9. Chert Split Pebble Scrapers



1

2

3

4

5

6

7

8

9

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